LABOUR POLICY IN A MONOCROP ECONOMY:

THE CASE OF MAURITIUS

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CONTAINS

PULLOUTS

LABOUR POLICY IN A MONOCROP ECONOMY :

THE CASE OF MAURITIUS

TABLE OF CONTENTS

The Colonial/...

Page

CHAPTER 2 (Cont'd)

LABOUR POLICY AND THE PLANTATION SYSTEM:

CHAPTER 3

THE WAGE STRUCTURE AND GOVERNMENT LABOUR POLICY

Government/...

Page

CHAPTER 3 (Cont'd)

THE WAGE STRUCTURE AND GOVERNMENT LABOUR POLICY

CHAPTER 4

THE PLACE OF THE SUGAR INDUSTRY IN THE MAURITIAN ECONOMY

Infrastructural/...

Page

CHAPTER 4 (Cont'd)

THE PLACE OF THE SUGAR INDUSTRY IN THE MAURITIAN ECONOMY

CHAPTER 5

GOVERNMENT MINIMUM WAGE LEGISLATION IN THE SUGAR INDUSTRY

Part I

Part II/...

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LIST OF APPENDICES

LIST OF TABLES

CHAPTER 3/...

CHAPTER 4/...

Page

CHAPTER 4

CHAPTER 5/...

LIST OF CHART AND FIGURES

A C K N O W L E D G E M E N T

I would like first of all to express my sincere thanks for the help I have received from so many persons during all the time which I spent working on my thesis. It is not an easy task to name all those who have helped me in my work. Now that the work is finished I am conscious of the debt which I owe to all of them. If I succeed much of the credit must be theirs.

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Mrs J Ah Chok has typed most of the first draft and the final version. Those who are familiar with my handwriting and untidiness will appreciate the amount of work that this has involved. My sincere thanks to her and to Miss D Madhoo and Miss S Aufojul who have also helped with the typing.

Finally/...

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D E C L A R A T I O N

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S U M M A R Y

Under the pressure of the population explosion and constitutional changes, social and economic conditions in Mauritius went through a process of rapid change after the Second World War. The introduction of universal suffrage unseated the white plantocracy and brought to power the representatives of the urban and rural working classes. This led to fundamental changes in the Government social and economic policy. In 1963, Government fixed the wages and conditions of employment of agricultural and non-agricultural workers in the sugar industry.

The first chapter describes the structure of the industry and the organisation of cane production on sugar estates. We study the pattern of land ownership characterised by the high concentration of cane land on millers' estates. The distribution of land will influence the rate of production and the allocation of resources inside the industry and the demand for and supply of labour on estates.

In the second chapter we study the Island's social system and its influence on Government labour policy. The forces which led to the Government intervention in the labour market originated in the social structure of the Mauritius plantation economy with its rigid divisions. This accounts for the underdevelopment of industrial relations which prompted direct Government intervention in labour matters.

The third chapter concentrates on the impact of Government regulations on the level of wages in the economy. The first part focusses on the importance of the sugar industry as a wage leader. We then study the effect of Government policy on the structure of wages and finally its influence on the distribution of employment.

The analysis of the macro-economic structure forms an essential part of the work. The fourth chapter comprises a detailed quantitative description of the structure of the Island economy, which provides a convenient framework for the study of the effects of wage increases on the Government finances and the Balance of Payments.

The fifth chapter is divided into two parts. In the first part we analyse the labour conditions on millers' estates through an investigation of the conditions of demand for and supply of labour. The second part provides an estimate of the marginal productivity of field labour during the crop and intercrop by means of production functions fitted to 1965 and 1973 data, in order to assess the effect of Government labour policy on the productivity of labour on estates.

LABOUR POLICY IN A MONOCROP ECONOMY:

THE CASE OF MAURITIUS

I N T R O D U C T I O N

THE RAPID PACE OF CHANGE AFTER THE WAR

In order to analyse and appraise a country's labour policy, we must bear in mind its socio-economic and political environment. The social and economic conditions of Mauritius went through a process of rapid change after the war, which profoundly disturbed the existing order and over a relatively short period of time, transformed Mauritius. After a long period of relative stagnation the pace of change accelerated rapidly under the pressure of events. Those events disturbed the previous balance and "propelled" the island forward on a road of development.

The most important event was the post war population explosion. The island population doubled between 1948 and 1970. That brought in its trail the usual problems of demographic explosion.

(i) a young population tends to aggravate the disparity between birth and death rates. Once the initial equilibrium has been disturbed, the disparity tends to become cumulative as the younger population leads to an increase in birth rates and decline in death rates;

(ii) there follows inevitably a rapid increase in the labour force as the numerous younger generations reach working age and enter the labour market;

(iii)/...

(iii) the change in the age-structure of the population leads to other discrepancies between the demand for and supply of labour as the younger generations shun traditional occupations in favour of "urban" white collar jobs.

Three other events played a determinant part in the process of emancipation of the Mauritian society after the war. They were the rapid increase in the rate of schooling at primary and secondary level; the achievement of independence and the opening up of the island to the rest of the world.

Schooling is a fundamental factor and a powerful catalyst in the process of modernisation of society.[1] It can improve the quality of labour, its social mobility, attitudes and aspirations, but may lead on the other hand to maladjustment and frustration if the job does not respond - as it rarely does in developing countries - to the expectations of school leavers. In that sense the rapid spread of education in the island, while desirable in itself, aggravated the imbalance between the supply of labour and the demand for it. To the quantitative aspect of the problem, schooling added a qualitative dimension. There is both a subjective and objective element in an individual's attitude towards the choice of education, and traditional - grammar-school - type of education tend to accentuate the discrepancy between the aspirations of school leavers and job opportunities.[2]

The/...

1. F H Harbison & C Myers: Education, Manpower and Economic Growth, Mc Graw Hill, ch 1, p2.
2. F H Harbison & C H Myers: Education, Manpower and Economic Growth, ibid ch 8, pp 175/176.

The third element in the process of rapid transformation of Mauritian society was the constitutional changes that took place in the preparation for independence and its achievement in March 1968. The thrust towards independence began with the 1948 constitution which liberalised the island's political system increased the franchise and the participation of elected members in the administration of the colony. In the 1948 elections political power passed from the white oligarchy of sugar estate owners into the hands of Hindu and Creole politicians.

The next important landmark was the 1957 constitution, which established universal adult suffrage. As a result the rural vote became a much more significant factor in local politics. In the ensuing elections the Labour Party won a crushing victory. There followed a series of constitutional changes which set the stage for independence. Class interests became less important in island politics as the various political parties began to muster support for the ultimate battle for independence. After 1959, group interests dominated the island's politics. Ethnic and religious affiliations became political symbols and the means of mobilising each section of the population against the others.[1] The 1967 Constitution marked the final stage in the process of political emancipation. The elections that followed took the form of a referendum on the issue of independence. The independence party won the elections and the island became independent from Britain in March 1968. After a very long period of political stagnation it only took twenty years for Mauritius to achieve independence.

Another/...

1. B Benedict: Mauritius: Problems of a Plural Society. Institute of Race Relations. Ch 4, p63.

Another important factor in the process of change that took place in Mauritius after the war was the opening up of Mauritius to the rest of the world. The establishment of frequent air services between Mauritius, Europe, Africa and Australia, the development of the tourist industry, and the spread of the radio and TV took the island out of its secular isolation at the periphery of civilisation into the modern world and had a profound impact on the way of life of the average Mauritian. For a long time Mauritius had remained a small, isolated and forgotten outpost of the British empire; the rapid improvement in the means of communication brought the island into daily touch with Europe while Mauritians were made aware through radio and TV of all the important events that occurred in the world. This had a profound effect on the attitudes and aspirations of the people. The demonstration effect is felt here in its full force.

Table 1 contains data for 1946 and 1976 with regard to a number of important "social indicators" from which the importance of the changes that occurred in Mauritius during that time can be gauged.

TABLE 1/...

T A B L E 1 : Economic and Social Indicators: 1946 and 1976.

	1946		1976	
Sugar production (000 tons)	291		690	
Population (000)	428		868	
Electricity (000 units)	12745		270176	
No of vehicles: Buses	145		1186	
Lorries & vans	536		8804	
Taxis	493		2288	
Private cars	1553		18368	
Imports: Ciment (m tons)	7876		220900	
Lamp oil and motor spirit (hectolitres)	131137[a]		776575	
Education: Primary - No of Schools	128[b]		235[b]	
No of pupils	40959		135090	
No of teachers	1203		5865	
Secondary - No of Schools	39		126	
No of pupils	5469		66920	
No of teachers	212[c]		2100[c]	
External communications:				
No of passengers inwards	3058		139303	
outwards	3131		141148	
	No	Tonnage (000)	No	Tonnage (000)
No of vessels & tonnage inwards	112	310	527	2070
outwards	109	306	513	2096
Passenger Transport:				
Number of passengers (000)				
Railways	479[d]		-	
Buses	-		16762	
No of doctors and specialists	Not available		360	
No of hospital beds (excluding prison hospitals)	1224		2802	

SOURCES: Central Statistical Office; Digest of Statistics 1946 and 1976
Government Reports 1946
Customs and Excise Department Annual Report 1976

a : includes white spirit
b : Government and aided primary schools only
c : includes unregistered teachers
d : Rail passenger service was discontinued in March 1956.

THE SUGAR INDUSTRY WAGES COUNCILS

Labour policy occupies a central place in a country's social and economic policy. Mauritius has for many years been facing a severe unemployment problem; over the last twenty-five years the demographic situation and unemployment have been the chief pre-occupations of Government. During that period Government took a series of measures in an attempt to deal with the situation. That period also witnessed a fundamental change in the part played by Government in industrial relations. After having been for several years the "arbiter of last resort" of industrial conflicts,[1] Government decided to play a more direct part in the process of wage negotiations. In 1961, the Regulation of Wages and Conditions of Employment Ordinance made provision for the establishment of Wages Councils and defined their powers. In 1963, Government set up Wages Councils for agricultural and non-agricultural workers in the sugar industry. The Wages Councils recommended a general increase in wages of about twenty-five per cent for agricultural workers and thirty per cent for non-agricultural workers. Their recommendations also dealt with the system of recruitment of labour on estates and other conditions of employment including hours of work and holidays. The Wages Councils further recommended the introduction of a scheme of guaranteed intercrop employment for workers who had achieved a certain rate of attendance at work during the crop.[2]

The/...

1. J P Ducler des Rauches: "Evolution of Industrial Relations in the Sugar Industry". Revue Agricole et Sucrière 1964.
2. The recommendations of Wage Councils were implemented by means of two Wage Regulation Orders made by the Minister of Labour. The provision concerning guaranteed intercrop employment could not be included in the Wage Regulation Orders and was the subject of a separate ordinance.

The Ordinance provided that a worker with an 80 per cent attendance record with the same employer during the crop - attendance being linked with the performance of a certain task - should be entitled to full employment during the intercrop and a worker who had worked more than 70 per cent but less than 80 per cent of the number of working days during the crop should be entitled to proportionate employment during the inter-crop. These regulations applied only in cases where the employer cultivated 25 arpents or more.[1] The result of these measures has been described in an official publication in these terms: "... While labour has become relatively more abundant, it has not in a wage economy, become any cheaper, at least for the large employers. At the very time when more labour was coming onto the market than was being absorbed in commodity production there has been a marked improvement in wage rates. Total payments to employees increased by fifty per cent between the late fifties and the late sixties, rather more than the growth in the labour force, let alone the growth in employment ..."[2]

THE ROLE/...

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1. D P Chesworth: Statutory Minimum Wage Fixing in the Sugar Industry of Mauritius - International Labour Review Volume 96 No.3.

2. Ministry of Economic Planning and Development: Development Strategy 1971-80 - December 1970 pp7,8. Money wages increased by fifty-one per cent between 1958 and 1968, while real wages increased by thirty-three per cent.

THE ROLE OF BRITAIN

A number of British missions visited Mauritius between 1959 and 1963, to advise Government on economic and labour matters. These missions played an important part in shaping Government labour policy. They studied the nature and extent of unemployment in the Island (Luce, 1959), the demographic situation (Titmuss, 1961), investigated wages and conditions of employment of labourers in the sugar industry (Luce, 1959, Meade, 1961 and Balogh, 1963) and made recommendations regarding future Government policy in these fields. In the face of an explosive demographic situation, they advocated a policy of wage restraint coupled with a moderate dose of social benefits,[1] - family allowances, widows' benefits, unemployment and health benefits - a decasualisation of employment and improvements in the method of recruitment in order to improve the earnings of labourers and their security of employment by reducing the fluctuations in income between the crop and intercrop. Owing to the weakness of labour organisations in Mauritius and the ineffectiveness of trade unions, they also advocated the establishment of Government wage boards in order to enforce a reform of wage policy in the Island. They did not confine themselves to labour problems, however, and made wide-ranging recommendations regarding future Government economic policy and the institutional and administrative machinery required to achieve these objectives.[2]

Much of/....

1. J E Meade "et al": The Economic and Social Structure of Mauritius; Cass (1968), Ch 2, p.12 §2.24 - 2.26.
2. These recommendations included the creation of an Economic Planning Unit, a Development Bank, an Agricultural Marketing Board, a Sugar Authority, etc. and the reform of education.

Much of the philosophy behind the new labour legislation originated in the recommendations of those missions; particularly the need for a fundamental reform of the conditions of employment on sugar estates, with direct Government intervention in and control over the wage fixing procedure in the sugar industry and the island generally. On the other hand Meade and Balogh specifically stressed the need for a stable wage policy in the economic circumstances of Mauritius.

The reports of the British missions may thus be seen as a first attempt at formulating a national wage policy and defining the institutions and instruments for its implementation. They saw the problem of employment and wage policy in the island generally and outlined a framework for subsequent action by Government in these matters.

The measures that were taken by Government diverged in many respects from the recommendations of the British missions. These recommendations were based on the visitors' analysis and interpretation of local problems. They did not take into consideration the political realities and constraints of the local situation.[1]

WAGE/...

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1. "To the economist who argues that income goals might be achievable by other means which would also be less distortive of the price of labour, the politician may retort that none of the other means have the simplicity of a minimum wage or social security payroll tax; nor would they have much chance of enactment."

   P Gregory: "Employment Implications of Public Regulation of Wages and Industrial Relations. A statement of Issues" presented to the International Industrial Relations Association, 4th World Congress, Geneva, Switzerland. 1976, p.3.

WAGE POLICY AND EMPLOYMENT CREATION

The object of this work is to provide an analytical framework for the study of the effect of government wage regulations in the sugar industry on the conditions of employment in the industry itself and throughout the island. The work seeks also to identify the technical, structural and economic constraints which Government faces in the implementation of its labour policy. More generally it provides a case study of the difficulties and problems facing governments of small plantation islands in labour matters.[1]

Employment creation is the major objective of Government in Mauritius. In an official document entitled "Development Strategy 1971-1980", and in the five year Development Plan (1970-75), which followed shortly afterwards, Government stated that the over-riding objective of development in Mauritius must be employment opportunities for the entire labour force.[2] Employment creation was to be the major criterion for judging the economic performance of Mauritius and the authors of the plan referred to the wide range of issues involved in an employment-centred approach to economic development, notably the trade-offs between wages and employment, employment and productivity, and wages and productivity. But there does not appear to have been any rigorous analysis of the nature of the relationship between these issues.

WAGE/...

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1. "So far as wage fixing is concerned the immediate need in under-developed countries is for principles which will guide government and public authorities in their decisions either as dominant employers of wage labour or as effective arbitrators of wage disputes generally."

   H A Turner: Wage Trends, Wage Policies and Collective Bargaining, the Problems for Underdeveloped Countries, Cambridge 1965

2. Ministry of Economic Planning and Development: Development Strategy 1971-1980 II(d) - p.19.

The employment strategy was apparently based on a series of simple projections of labour utilization in individual industries, without an attempt at formulating a general model of the Island economy. But because of the intricate nature of the relationship between these factors, a general analysis of the problem would appear to be essential in order to overcome the inconsistencies to which a partial analysis might give rise. Without this, much of the analytical work behind the Plan must perforce rest on "a priori" postulates of doubtful validity.

The study of the effect of government wage policy on the sugar estates labour force must be conducted within the framework firstly of sugar cane technology and secondly of the plantation system. Cane technology determines the nature of field operations and the (seasonal) demand for labour, while the plantation system determines the organisation of the labour force, and the land-labour combination. We must also consider the importance of the sugar industry as an employer of labour, which is reflected in the high percentage of wage earners employed by sugar estates, which account for approximately two-thirds of wage earners in non-governmental employment. This would imply that the level of employment and wages in the Island may be strongly influenced by the conditions of labour on the sugar estates.[1] In Chapter 3, we shall verify this assumption and the importance of the sugar industry as a wage leader in the Island labour market. Besides the study of the macro-economic

"milieu"/....

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1. J E Meade "et al": Op.cit. Ch 2; see also P Hein: Les Relations Industrielles à l'Ile Maurice: Thèse pour le Doctorat de 3ème cycle, Université d'Aix Marseille, mimeo. Ch 2 p.63: "L'industrie sucrière est tellement importante et omniprésente à Maurice que les rapports qui s'établissent et les pratiques qui prévalent dans cette industrie auront tendance à entrainer le reste du secteur non-gouvernemental ..."

"milieu" will enable us to place the problem of wage regulation in a broader national context. Measures taken to regulate wages and employment in such a dominant industry will have repercussions elsewhere in the economy and, to the extent that they imply a redistribution of income from profits to wages, may have important effects on the macro-economic situation, on the rate of consumption and saving and the Balance of payments.[1]

AN OUTLINE OF THE WORK

The production structure of a country is one of the determinants of the payments made to factors and income distribution. It provides an essential element in the analysis of the relationship between the level of wages and employment in the country. In the words of an ILO publication: "It is scarcely necessary to recall that the effect of higher wages depends very much on the particular conditions of the country, the industry or the undertaking concerned."[2]

An aim of the work will be to consider how far Government is constrained in the implementation of its wage policy by the technological factors and the structure of the economy. For that purpose we shall study the impact of Government Minimum Wage Legislation on the productivity of labour on sugar estates and on the wage and employment situation in Mauritius generally. In that way we hope to identify some of the fundamental factors that determine the employment conditions in the island, and thus provide an analytical framework which may be useful to Government in the formulation of its future labour policy.

In the/...

1. For a theoretical treatment of this point, see S A Marglin: Value and Price in a Labour-Surplus Economy, O.U.P.1976 Pt II Ch 3
2. International Labour Office: Minimum Wage Fixing and Economic Development. Geneva 1968. Part 1.

In the first chapter we shall study the structure of the sugar industry and the organisation of cane production in the island. This chapter will describe the sequence of field operations that determines the seasonal demand for labour inside the industry. Cane yields are determined to some extent by the structure of ownership and organisation of the industry. Yield differentials are positively associated with the size of holdings. Half of the land under sugar cane is concentrated in twenty-one estates each with its factory and it is on these millers' estates that the yield is highest: they account for over 60% of the cane harvested. The remaining land under sugar is in the hands of about 30,000 large and small planters, many of whom work tiny holdings to supplement income from wages. For various reasons, including inferior soil and inadequate financial resources, the small planters achieve substantially lower yields than the estates.

The structure of ownership and organisation of the sugar industry has a direct bearing on our work. It explains the relatively intensive nature of cane cultivation on millers' estates, and the importance of planters cane in supplementing the estates crop. Moreover the class of small planters and field labourers overlap to some extent, as many small planters work as labourers on sugar estates or with other planters. Before the creation of a regular labour force most of the labour on estates was casual labour which moved to the estates during the harvest and reverted to their normal occupation - market gardening, fishing or masonry - when the sugar crop was over. Even today virtually all labour employed by small planters is casual labour drawn from nearby villages.

In the/....

In the second chapter we shall study the motives which led to the regulation of wages and conditions of employment in the sugar industry. These motives were technical, economic and political. The official reason was Governments belief that there was no adequate machinery for the effective regulation of wages and other conditions of employment of workers in the sugar industry. In our analysis of the factors which led to the passing of the wage regulations, we shall consider the social structure of Mauritius and its influence on the system of industrial relations inside the industry and in the island generally. Our contention will be that the direct intervention of Government in the process of wage determination was warranted by the underdevelopment of industrial relations in Mauritius.[1] The Government's attitude in labour matters was part of the process of political emancipation which, in the period between 1950 and 1967, saw the coming to power of the Labour Party. That party drew most of its support from the rural population of small planters and agricultural labourers. The advent of the Labour Party was accompanied by social measures and a re-distribution of income in favour of the lower income groups. It was during that period when the island was pressing forward towards independence that some of the most characteristic features of the Mauritius system of industrial relations emerged, largely as a result of Government intervention.[2]

Thus the forces/...

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1. P L Hein, op.cit., Ch3 p.123

2. P L Hein, op.cit., Ch 1 p.15. "C'est pendant cette phase de poussée vers l'indépendance que certains des aspects les plus charactéristiques du système maricien des relations industrielles apparurent grâce précisément à l'intervention de l'Etat."

Thus the forces which led to Government intervention in the labour market originated in the social structure of the Mauritius plantation economy: the concentration of wealth and income in the hands of a small group of white estate owners, the large subordinate group of small planters and agricultural labourers belonging mostly to the Hindu community, the rigid social divisions where ethnic and occupational boundaries broadly coincide.[1] On these foundations were grafted the trappings of a modern state in preparation for political emancipation and independence. To be understood correctly, the motives behind Government intervention must be studied in the social and political context to which they belong.

The third chapter will investigate the importance of institutions - especially trade unions and Government - in the process of wage determination in the island. The impact of minimum wages in the sugar industry on the rest of the economy must depend to a large extent on the institutional system, and the degree of interdependence that exists between the various sectors of the labour market.[2] It will also depend on the strength of imitative behaviour on the part of employers and unions. Professor Meade laid stress on the importance of the sugar industry in the island wage system in these terms: "The sugar industry is of such central importance that the wage rates paid in that industry are likely to set the level that will be acceptable in other industries."[3] It will be our aim in this chapter

to provide/...

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1. B Benedict, op.cit: Mauritius: Problems of a Plural Society, pp.27 and 66.
2. C Mulvey & J A Trevithick: Some Evidence on the Wage Leadership Hypothesis, Scottish Journal of Political Economy (1974), pp.1, 2.
3. J E Meade 'et al': The Economic and Social Structure of Mauritius. Op.cit. ch2 p.13 §2.28.

to provide empirical data in order to test that assertion and to determine the extent to which the sugar industry may have "led" other sectors with regard to wages and conditions of employment. We shall also examine the relevance of various wage theories - neoclassical, institutional and structural[1] - to the conditions prevailing in the island labour market.

Our study of the evolution of the wage structure will be based on an analysis of the movement of earnings in the island after 1966. The objective will be to look for evidence of the existence of a pattern in the evolution of earnings. This would imply an underlying structure which holds together the wages paid in different sectors. The experience of Mauritius in this

respect/...

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1. The term neo-classical refers to these theories (viz: J R Hicks Theory of wages) according to which wages are determined like any other prices by the conditions of demand and supply. The law of diminishing marginal productivity is regarded by most neo-classical economists as the most fundamental principle of the theory of wages. Departures from the free market conditions caused by monopolistic organisations, government action or unions are treated on the same lines as in the theory of price determination. According to the neo-classical school, wage theory is a special case of price theory.(a) The potential mobility of labour is the ultimate sanction for the inter-relation of wage rates.(b)

   The term institutional refers to the body of theories according to which wages are not determined primarily by market-forces but by the deliberate action of institutions operating in the labour market. According to them, wages are 'administered prices' set by employers' organisations or trade unions; and wage changes are transmitted from one sector of the labour market to another not by a market mechanism but by a spill-over mechanism.

   (a) R G Lipsey: An Introduction to Positive Economics, 3rd ed. Ch 26, p.329.

   (b) J R Hicks: The Theory of Wages, 2nd ed. Ch 4,p.79.

respect will be compared with that of other developing countries to determine how far wages in the island can be said to constitute a system and the role of the sugar industry, trade unions and Government within the system. We shall also analyse the role of Government as the alternative employer, and the drift of labour from the sugar industry and other traditional sectors into Government employment.

When we study an economic event, or any event for that matter, it is necessary to study the environment in which it occurs. The fourth chapter will provide an analytical framework and reference base for the study of the macro-economic effects of the Government wage policy. The study of the structure of the Mauritian economy will enable us to place the problem of wage regulation in its broader context. The economy of a country is like a combination of parts that inter-penetrate and interact in a continuous fashion.[1] Our aim in this chapter will be to provide a detailed quantitative picture of the island economy, a macro-economic framework, that will serve as a convenient reference base for the rest of the work. It will also enable us to identify the macro-economic constraints facing Government in the implementation of its minimum wage policy.

This chapter will be devoted to the construction of a Social Accounting Matrix (SAM) for Mauritius based on the 1974 data.[2] It begins with a discussion of the SAM and its usefulness and

relevance/....

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1. P Eglier: Problèmes et Perspectives de l'Emploi à la Réunion. Collection des Travaux du Centre Universitaire de la Réunion à St Denis. 1972 (Translated from French).

2. There exists no published Input-Output table for Mauritius. We had therefore to build one from the primary data available at the Central Statistical Office. We were assisted in our work by the Staff of the National Accounts Section of the CSO. Half way through the work, an Input-Output table for 1976 was prepared by a French Mission, which helped to clarify our ideas in various ways.

relevance for the study of the macro-economic aspects of Government wage policy, with regard to its influence on prices, output, income, public finance and the Balance of Payments. The SAM incorporates into a single matrix, different sets of accounts covering production activities, the distribution of income and its expenditure; and brings to light the secondary or induced effects of wage increases. In that way the SAM probes into the hidden part of the economic "iceberg".

The production accounts are presented in the form of a conventional Input-Output matrix, and cover thirty different activities; the factor accounts show the payments received by different categories of factors for their contribution in the production of goods and services and the institutional accounts show the distribution of income to households, firms and Government, as well as the transfer of income between these institutions. The SAM will be accompanied by a physical manpower matrix covering the thirty production activities identified in the main table, which will show the structure of employment and the percentage of different labour categories employed in each production activity.

The fifth chapter studies the effect of Government labour policy, and particularly the 1963 Wage Regulation Orders on the level of wages and employment in the sugar industry. The chapter is divided into two parts. The first section begins with a brief description of the institutional framework, followed by an analysis of the conditions of demand for and supply of labour inside the industry. It emphasizes the seasonal differences in productivity and their effect on employment and earnings of the field labour force. It also examines the conditions of labour

supply/....

supply on estates, the high rate of absenteeism, the importance of alternative occupations and the rate of unemployment and underemployment among the agricultural labour force. The analysis of labour supply will consist in an enumeration of various factors which may influence the availability of agricultural labour on estates.

The second part consists of a quantitative analysis of field production and the estimation of a production function for millers' estates, in order to measure the effect of seasonal conditions - and the impact of labour legislation - on labour productivity. The data relate to the 1965 and 1973 crops. We shall consider problems associated with the estimation of aggregate functions from cross-sectional data, quality differences in land and labour inputs, multi-collinearity and heteroscedasticity and identification problems. The form of the function, the choice of variables and their specification will also be discussed. We then proceed to the analysis and interpretation of the results. A comparison of the 1973 results with those of 1965 reveals certain significant changes in labour productivity between those two years. We conclude this part with a brief study of the effect of the new labour legislation on the redeployment of labour on estates and the decasualisation of the estate labour force. This will throw some light on the degree of flexibility which may exist in the timing of operations and the organisation of field work: how far is the pattern and sequence of field operations determined by technical conditions, how far by the availability of labour?

In the concluding chapter, we shall bring together the various parts of the work:

(i)/...

(i) The forces behind the 1963 Wage Regulation Orders take their origin in th eisland plantation society: a system centred on the sugar industry and characterised by fairly rigid class-caste divisions and a high concentration of wealth and income. These measures have given expression to the conflicts and stresses which inhere in the system and the latent antagonism between the white Plantocracy and Indian labourers.

(ii) The wage structure reflects the influence of the institutional forces and structural rigidities. Mauritius has a highly distorted wage structure. On the other hand, the existence of an effective wage-gap between Government and the sugar industry has lead to a shift of labour from the latter into Government employment, a growing labour surplus in the public sector and increasing shortages elsewhere.

(iii) Being given the high degree of wealth concentration and wage disparities, it would appear that the distribution of income in Mauritius is very unequal. A fundamental aim of Government wage policy must be therefore to reduce this inequality. On the other hand the monocrop nature of the economy results in a high degree of economic dependence and the share of imports and exports accounts for a large percentage of domestic production. In these conditions, internal inflation is not a feasible way of adjusting to money-wage increases and wage changes operate mainly on employment or the Balance of Payments. Thus the structure of the economy sets narrow limits to Government action in these matters.

(iv)/...

(iv) The grading of field work on estates reflects the effect of seasonal conditions on labour productivity. On the supply side, the social environment and alternative occupations exert a strong influence on the attitude of workers and may create an artificial scarcity of labour in the sugar industry in spite of substantial unemployment and underemployment.

Before 1963, half of the labour force on estates was casual and in their case wages were often determined on an "ad hoc" basis between individual estates and job contractors. This system would tend to cause a dispersion of wages. In these conditions the introduction of a minimum wage (and the elimination of intermediaries) could lead to a more uniform system. On the other hand the imposition of a minimum wage with compulsory intercrop employment might give rise to a labour surplus on estates during the intercrop, and a more rational use of labour during the crop. These hypotheses were tested by means of production functions fitted to data for 1965 and 1973. The results show that there was indeed a significant decline in productivity during the intercrop and a significant improvement in crop-time labour productivity between 1965 and 1973.

The analysis of the labour data also indicates that these measures have led to a certain reorganisation of field work and redeployment of labour on estates probably in an attempt to reduce the seasonal differences in the demand for labour.

CHAPTER 1

THE ORGANISATION OF THE SUGAR INDUSTRY

(1) The Process of Cane Cultivation

Sugar cane is a perennial plant. The first crop is known as virgin cane or plant cane. Once cut the cane produces new offshoots or ratoons for several years. Virgin canes mature after 15 to 24 months.[1] Ratoon canes mature after 12 months. Sugar cane cultivation is characterised by a relatively long planting cycle. Cane land is replanted every eighth or ninth year. That means that an average of 11 to 12 percent of the total cane area is replanted every year. The cropping cycle depends on a number of technical and economic factors.

We shall first of all consider the agricultural operations associated with cane cultivation. These operations will differ to some extent for virgin canes and ratoons.

(a) Virgin Canes: The first step involves the clearing and preparation of land before planting. This comprises derocking and stone clearing, subsoiling and furrowing; a dose of rock phosphate and of sillicate is added where necessary. After furrowing an application of phosphatic guano is made followed by potassium. The phosphatic guano and potassium applications must be made at the time of planting; fertilisation must be well balanced i.e. applied

in the right/...

1. Cane which matures after 24 months is known as "grande saison", after 15 months as "petite saison".

in the right proportion and in the right quantity. Fertilisation accounts for about 25 to 30 per cent of the total cost of cultivation. It has a significant influence on cane output.[1]

The next stage consists in the preparation and planting of cane cuttings. Most estates produce their own planting material. Some planters obtain their planting material from estates or from the Government cane nursery. But the large majority of them use inferior quality material from their own or from a neighbour's plantation.[2] Canes are planted at the beginning of the year in March/April for "grande saison" and July/August for "petite saison". Canes are generally planted in "grande saison" in the North of the island because of the risk of drought.[3] The time of planting will determine the pattern of cropping. The cropping cycle is less important in the case of ratoons.

Immediately after planting, herbicides are applied before the emergence of the new cane shoot. Fields are weeded four to five times during cane growth depending on the amount of rainfall. Herbicides are also applied at different intervals during cane growth. The control of weeds is

one of/...

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1. See below Ch.5 Part 2, p.396.
2. Ministry of Agriculture and Natural Resources: Survey of Sugar Cane Planters and their Production Pattern: March 1973, Ch3, p.24.
3. The reorganisation of field work on estates following the new labour legislation and the decasualisation of field labour haveled many estates to abandon "petite saison" and plant all their cane during the slack season, especially on rocky land which requires comparatively more labour. See below Ch.5 Part 2, p.399.

one of the most important factors in the achievement of high cane yields. Use of chemical herbicides is generally combined with manual weeding. Finally, just before harvest, the trash is removed from the cane plant to facilitate cutting operations.[1]

(b) Ratoon Canes: The land is cleared as soon as possible after cutting. This operation must be performed within a reasonable time (not later than thirty days after the crop, generally sooner). Fertilizers are next applied and the cane lines are then covered with soil. Fertilizers must be applied immediately after the land has been cleared and in no case later than December. The next step is to apply herbicides before the emergence of the new cane; all these operations must be performed as soon as possible after cropping. This creates a substantial demand for labour which coincides with crop time work.[2] The bulk of field work in the case of ratoon canes is concentrated in the month or two after cropping and little more field work is required during the remainder of the growing season. The fields are weeded three or four times during cane growth and trashing is done before harvest as in the case of virgin canes. "It must be very strongly stressed that all the above operations must be envisaged as forming part

of an/....

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1. For an analysis of the relation between the amount of rainfall and the use of herbicides on estates, see below Ch 5, Part 2, pp.394/396.

   In order to reduce labour requirements many fields are burnt before harvest. This eliminates trashing and land clearing after cutting.

2. Land clearing, earthing-up, fertilization and half of the weeding operations are carried out during the first part of the intercrop season i.e. between June and December (See below Chapter 5, Part 2 Table 59(a)).

of an integrated process. Each of these operations must be performed at the right time and in compliance with the proper phasing. If not, the one operation which is skipped will play as a limiting factor and the whole process will be jeopardized."[1]

This is a brief outline of the process of cane cultivation and the organisation or phasing of field work on estates. In the rest of this chapter we shall examine the pattern of land ownership inside the industry and the institutional and functional relations between millers and planters.

(2) The Structure of Land Ownership and its Influence on the Allocation of Resources

The average distribution of small planters according to the size of their holdings, is given in Table 2 below.

TABLE 2 : Frequency distribution of planters' land
(Average 1971 to 1975)

Range	Owner Planters		Tenant Planters		Total	
	No of plantations	Acreage (Arpents)	No of plantations	Acreage (Arpents)	No of plantations	Acreage (Arpents)
0.001- 0.99) 1 1.99) 2 - 4.99)	26,253	34,248	1,309	2,374	27,562	36,622
5 - 9.99	1,709	11,312	188	1,243	1,897	12,555
10 - 24.99	633	9,380	73	1,133	706	10,513
25 - 49.99	127	4,574	13	426	140	5,000
50 - 99.99	63	4,382	3	189	67	4,571
100 -199.99	25	3,281	5	723	30	4,004
200 -499.99	27	8,231	1	184	27	8,415
500 and over	5	5,075	-	-	5	5,075
TOTAL	28,842	80,483	1,592	6,272	30,434	86,755

SOURCE: Central Statistical Office: Bi Annual Digest of Statistics.

1. The Mauritius Chamber of Agriculture: Report on Planters' Sugar Cane Yields. Section 3, p.11.

TABLE 3 : Frequency distribution of estates land
(based on the 1965 and 1973 crop figures)

Range	1965		1973	
	No of Estates	Acreage (Arpents)	No of Estates	Acreage (Arpents)
Less than 999	1	819	-	-
1,000 - 1,999	1	1,891	4	6,803
2,000 - 3,999	12	34,293	7	20,632
4,000 - 5,999	5	25,526	6	28,064
6,000 - 7,499	4	24,565	4	25,868
7,500 - 9,999	-	-	1	8,351
10,000 & above	1	11,441	1	11,857
TOTAL	24	98,535	23	101,575

SOURCE: Mauritius Chamber of Agriculture.

Close to half of these planters cultivated less than one arpent.[1] At the other end of the scale, there are the millers estates. They range in size from 1,000 to 12,000 arpents. The distribution of millers estates by size is given in Table 3. These figures relate to the 1965 and 1973 crop seasons.

Fifty-eight per cent of the estates in 1965 and forty-eight per cent in 1973 harvested less than 4,000 arpents of cane land. They accounted for 38 per cent and 27 per cent, respectively, of the total acreage harvested by estates. Thus the Mauritius sugar industry shows a similar pattern of land distribution to that which is found in many other developing countries particularly in Asia and Latin America: a small number of large holdings on the one hand and a large number of micro-units on the other; and to that extent the problems of under-development and low productivity which characterise the agrarian sector in these countries, may also apply in Mauritius.[2]

1. Ministry of Agriculture and Natural Resources: op.cit. Ch 3 p.14.
2. M P Todaro: Economics for a Developing World. Longman 1977 Ch 6 pp.177-180.

Such a highly concentrated pattern of land distribution may create important distortions in the allocation of resources and a consequent loss of productivity for the industry as a whole. The influence of the structure of land ownership on the allocation of labour and capital resources in the agricultural sector has been studied by a number of economists and social scientists. G L Beckford[1] argues that the monopolisation of land and productive resources by estates creates an agricultural proletariat, leads to the casualisation of the labour force, and seasonal unemployment. These distortions are compounded by population growth, as a result of which an increasing number of people are "bottled up" in the informal rural and urban sectors and depress the productivity in these sectors. The under-utilization of the growing labour force and low, stagnant, even falling productivity is due to the fact that the bulk of the people have little or no access to the necessary cooperant resources. Another reference to the distortions caused by a highly concentrated pattern of land ownership is found in J and L Crusol.[2] They argue that the system of land ownership in island plantation economies has created two serious distortions: an over utilisation of labour and relatively low output per individual on small farms, and a relatively wasteful use of land and the under-capitalisation of production on large estates.[3] The influence of the pattern

of and/....

1. G L Beckford: Persistent Poverty, (Underdevelopment in Plantation Economies of the Third World (OUP, 1972)), Ch 4, pp. 85-86 and Ch 6 pp.177-180.

2. J and L Crusol: World Development, Vol.8, No.12 December 1980 p.1028.

3. The relatively long cropping cycle adopted on estates in Mauritius may be an example of the wasteful use of land referred to by Crusol.

of land ownership on agricultural productivity is also discussed by M P Todaro[1] while A Berry and R H Sabot[2] have expressed the opinion that the distortions found in labour markets in developing countries may reflect the distortions found in other factor markets and notably the land market.

Generally it can be said that the engrossment of land by the large estates and the crowding of small farms puts up the rental value or price of land on small farms above what it would otherwise have been and above the value of land on estates; whereas the growing population density on small farms depresses the wage rate below its competitive level. These imperfections are further aggravated by distortions in the capital market. There are important inter-relations between factor markets and a highly distorted land market may create serious distortions in the labour and capital markets and may lead to misallocation of resources in these markets. Thus the structure of land ownership provides an essential element in our analysis of the labour market conditions in the sugar industry and in the island generally.

Besides distortions in the land, labour and capital markets will result in a less efficient combination of resources, depress the productivity of labour on small farms and result in a 'yield gap' between the small plantation and the estate.

As there/...

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1. M P Todaro: Economics for a Developing World, op.cit. Ch 15.

2. A Berry and R H Sabot: Labour Markets in Developing Countries World Development, Volume 6 No.11/12, November-December 1978 p.1227.

As there are strong linkages between field and factory in cane sugar production, and a substantial reduction in the average milling costs with an increase in the volume of cane processed,[1] this could lead to an over production of cane on estates in order to compensate for the relatively lower yields on small plantations.

To prove that there is over production of cane on estates in this sense, we must show that the marginal cost of cane cultivation is higher on estates than on small plantations.[2] The absence of data regarding the cost of production of small planters prevents a quantitative analysis of the cost differentials between the large estates and the small plantations. But there are certain indications regarding the structure of the cost-output relationship in each case, which may help to arrive at a qualitative conclusion.

(3) The Cost-Output Relationship in Cane Production and Processing

Generally the more important the contribution made by fixed factors in total output, the more constrained production will be and the more important the diminishing returns. Natural factors-climate and land quality - play a determinant role in cane production,[3] hence we would expect

marginal/.....

1. See below, page 34.

2. From the point of view of the whole industry, there is over-production of cane on estates if the marginal cost of cane production there exceeds the marginal cost of production on small farms. In these conditions the overall marginal cost of cane productioncould be reduced by reducing the cane output on estates and increasing output on small plantations. C E Ferguson and J P Gould: Micro-economic Theory - R D Irwin 4th ed (1975), Ch 9 pp.277,278.

3. See below Chapter 5, part 2 pages 356/358.

marginal costs to increase fairly rapidly with the more intensive cultivation of cane. The rate of output at which diminishing returns begin to operate, however, will also depend on the type of technology used.[1] Besides the cost-output relationship in cane production - the rate at which average cost increases as the rate of output increases - will depend on the structure of costs.

An estimate of cane production costs for different categories of planters was published in a report prepared by a firm of consultants for the Mauritius Chamber of Agriculture. According to these estimates the cost-per-ton of cane was slightly higher on small plantations than on millers estates. The cost-per-ton of cane cultivation, harvesting and transport on small plantations was estimated at Rs 32.70 as compared with Rs 26.60 on estates. The higher cost of cane cultivation on small plantations is due to a number of factors: poor soil quality, lower standards of husbandry and agricultural efficiency and scale economies.[2] With regard to the higher costs of harvesting and transport, these may due to the higher rates paid for cutting and loading by small planters as compared with estates. According to a report by the Mauritius Chamber of Agriculture[3], the small planters using a seasonal

labour force/...

1. We refer here to what has been called "land augmenting technology" i.e. the development of more productive cane varieties, shorter ratooning cycles,etc.

2. J M Paturau: Les Economies d'Echelle dans l'Industrie Sucrière: Communication pour le 11ème Congrès de l'ARTAS, Réunion 16-26 Octobre 1979, p.2.

3. Chambre d'Agriculture de l'Ile Maurice. Problèmes de Main d'Oeuvre dans l'Industrie Sucrière. Juin 1976, Ch 5 p.54.

labour force had to pay rates in excess of those prescribed by the National Remuneration Orders which applied on estates. This was due to the rapid drop in the number of casual labourers as a result of the establishment of labour intensive public work projects.

The estimates of cane production costs for different categories of planters are given in Table 4. The figures relate to 1971.

TABLE 4

Comparison of Production Costs for Different Categories of Planters

Cost per Arpent Cultivated, 1971 (Rupees)

Cost Category	Estates	Large Planters (>25 arpents)	Small Planters (<25 arpents)
1. Overhead	328	260	130
2. Cultivation costs	562	540	510
3. Harvesting and transport	241	221	209
TOTAL	1,131	1,021	849

Cost per Ton of Cane, 1971 (rupees)

Cost Category	Estates	Large Planters (>25 arpents)	Small Planters (<25 arpents)
1. Overhead	10.8	10.0	5.9
2. Cultivation Costs	18.6	20.8	23.2
3. Harvesting and transport	8.0	8.5	9.5
TOTAL	37.4	39.3	38.6

SOURCE: McKinsey & Company, Inc. Report Commissioned by the Mauritius Chamber of Agriculture. The Role of the Sugar Industry in the Development of Mauritius: Chart 5.

According/...

According to these figures, overhead costs incurred in cane cultivation are nearly twice as high percentage wise on estates as on small plantations; they account for 29 per cent of the cost of a ton of cane produced on estates, while they represent 15 per cent of the cost per ton on small plantations. The difference in the percentage of overhead costs in the total cost of cultivation will have an important bearing on the cost-output relationship in each case. The higher the percentage of overheads in total cost, the greater their influence on average costs. Average costs will thus be expected to increase more slowly on estates than on small plantations. With given cane prices, these two factors - the more capital intensive type of technology and higher overhead costs of cane cultivation - will tend to result in a higher rate of output per arpent on estates than on small plantations.

Cane sugar manufacture is a chemical process. The growing and processing of sugar cane are inter-related and sequential stages in the process of sugar production. This gives rise to important linkages between field and factory production, which are reflected in the high degree of vertical integration, which generally characterises the organisation of the cane sugar industry.[1] On the other hand in common with other agricultural crops, cane sugar production is seasonal, the time of harvest being determined by the maturity of the cane, which must be harvested as close to

maturity/....

1. For an interesting analysis of the effects of forward and backward linkages on the development of the West Indian Sugar Industry, see G L Beckford, op.cit Ch 5, p.138.

maturity as possible. The date of harvest will thus have a strong influence on cane quality and the amount of sugar produced.[1]

The following factors have a determinant influence on the quantity of sugar produced - the tonnage of cane produced, cane quality - i.e. the sucrose content, fibre content and impurities - and the level of technology.

The level of technology refers particularly to the capacity of the cane mills[2], crystallisers and centrifugals. There would appear to be a close relation between plant capacity and operational efficiency inside the modern sugar factory. This would imply the presence of economies of scale in sugar processing; this is supported historically by the general tendency towards a concentration of sugar factories in all cane sugar producing countries.[3]

As a result of the large amount of investment required in the modern factory and the seasonal nature of the crop, sugar factories generally operate well below capacity. In these circumstances, the unit costs of sugar processing will be expected to decline substantially with an increase in the volume of cane processed. In a time-series analysis of the

influence/...

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1. There is ample evidence of a strong inverse correlation between the duration of the crop, cane quality and the amount of sugar recovered from cane.
K Lutchmeenaraidoo "et al". Committee of Enquiry (Sugar Industry) 1972-73, Ch 6 pp.44-47.

2. Milling capacity is measured in terms of kgs of fibre/hour/m^3 of total roller volume.

3. J M Paturau. Les économies d'Echelle dans l'Industrie Sucrière, op.cit. p.1.

influence of factory capacity on processing costs in Queensland cane factories[1], it was found that 97 per cent of the variations in costs could be explained by regressing total factory costs on a quadratic function of the volume of cane crushed and the seasonal capacity of factories (corrected for time).[2] By putting the time variable (T) at a particular value (in that case 1966), and inserting two particular values for plant capacity (R) corresponding to a 100 ton and 200 ton-per-hour plant, over a range of values for the volume of cane, Ryland obtained two short run average cost curves corresponding to the stipulated plant capacities. By equating to zero the first derivative of the average cost function with respect to the volume of cane, he calculated the volume of cane that would correspond to the minimum average cost in each case. Ryland thus found that the volume of cane that would give minimum cost for a 200 ton-per-hour plant, was 1,263,120 tons; for

a 100 ton per/...

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1. G J Ryland: Economies of Scale in Sugar Milling. Proceedings of the 36th Conference of the Queensland Society of Sugar Cane Technology (1969).

2. The total cost function estimated by Ryland gave the following results:

$$C_t = \underset{(63.725)^{**}}{254{,}27763} + \underset{(.25005)^{*}}{.26263\ X_{1t}} + \underset{(.00031148)^{**}}{.00092148\ X^2} + \underset{(.26914)^{**}}{.8581\ R_t} + \underset{(3.9325)^{**}}{35.039991T} \qquad R^2 = .973$$

* : not significant
** : significant at .01 level

Where C_t stands for total cost in units of $1,000.

X_t stands for tons of cane crushed in units of 1,000 tons.

R_t is a measure of the seasonal capacity of plant[(a)] and

T is a variable indicating time.

(a) R_t = the size of mill expressed as the average number of tons of cane crushed per hour multiplied by the number of hours of effective crushing time.

(continued next page)

a 100 ton-per-hour plant it was 1,147,220 tons.[1] These calculations indicate that the achievement of minimum average costs in raw sugar manufacture is impossible owing to the maturation behaviour of cane, seasonal variations in climate and the refractory character of cane juice. The cane must be cropped as near to maturity as possible and must be processed as soon as possible after it has been cut. Hence factories must operate during a limited period of time every year; during that time, they run almost continuously. In Mauritius the sugar crop lasts on average 120 days and during that time factories work an average of 20 hours per day.

Ryland's analysis of the cost of production in Queensland factories sought to determine the influence of the quantity of cane crushed and factory capacity on the total and average costs of cane processing. As the system of cane sugar manufacture is fairly standard in different countries, we can assume that the results obtained for the Queensland mills could also apply to Mauritius; although we should not expect the capacity output[2] - i.e. the volume of cane associated with the minimum average cost of processing - to be the same in each case.

What we can/...

The choice of the volume of cane processed rather than raw sugar produced as explanatory variable assumes that all cane is of constant quality. This does not take into account variations which may occur in the cost of production due to random fluctuations in cane quality.

1. Thus a 200 ton-per-hour plant would have to work for about eleven months at the rate of 23 hours per day and six days per week in order to minimize unit costs.

2. Capacity output is defined here as the level of output that corresponds to the minimum short-run average cost. A plant producing with excess capacity is producing at an output smaller than that which corresponds to the minimum average cost. R G Lipsey: An Introduction to Positive Economics, 3rd ed. Ch 18 p.221.

What we can safely say, it seems, on the basis of these findings is that the Mauritian factories processing an annual average of 270,000 tons of cane (ranging from 139,000 to 725,000 tons) [illegible] are all operating well below capacity. Thus we can expect a substantial reduction in the average cost of cane processing with an increase in the volume of cane processed in the short run; and important economies of scale with an increase in the capacity of factories in the long run.[1]

We have seen above[2] that the 21 factory estates cultivate more than half of the cane land in the island, 102,000 arpents, while the remaining 87,000 arpents are cultivated by independent planters. These plantations vary in size from less than one arpent to over one hundred arpents; they are cultivated by 30,000 planters half of whom cultivate less than one arpent of cane land. Millers estates produce on average[3] 64 per cent and planters 36 per cent of the total tonnage of cane crushed by factories. These percentages vary considerably between individual factories. At Union-St Aubin factory planters' canes account for only 2 per cent of the total quantity of cane crushed. At Solitude factory, on the other hand, seventy-six per cent of cane processed is grown by planters.[4] Clearly, in view of what we have said above regarding the conditions of excess capacity prevailing in Mauritian factories and the

expected/...

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1. Ryland's results show that the size of plant has a strong influence on factory costs. This would mean important economies of scale in the long run.
2. See above pages 25/26.
3,4 : These figures relate to the period 1971 to 1975.

expected drop in the average cost of cane processing with an increase in the volume of cane processed, these "outside" supplies of cane will have an important influence on the production costs of individual factories. Generally the greater the cost reduction achieved by processing a larger volume of cane, and the greater the proportion of planters' canes in the total volume of cane processed, the greater the benefits accruing to each factory from processing these canes. The percentage of planters' canes crushed by individual factories, factory capacity and the percentage of millers' canes to factory capacity for the period 1971 to 1975, are shown in Table 5.

TABLE 5/....

T A B L E 5 : Millers' Canes. Percentage of Factory Capacity

Name of Factory 1	T.C.H.[1] 1972 2	Factory Capacity (TCH x 23 hours per day for 130 days 3	Tons of Cane Crushed[2]			Millers Cane % Factory Capacity (4/3) 7
			Millers 4	Planters 5	Total 6	
Medine	162.2	447720	259843	136356	396199	58
Solitude	87.4	241200	49198	141661	190859	20
Beau Plan	87.9	242640	123697	62469	186166	51
The Mount	87.9	242640	145710	63549	209259	60
Belle Vue	118.0	325680	119054	139700	258754	37
St Antoine	105.2	290400	97736	122562	220298	34
Mon Loisir	127.7	352440	195239	98652	293891	55
Constance	109.8	303000	138163	115611	253774	46
Union Flacq	250.5	691320	453451	271605	725056	66
Beau Champ	151.2	417360	289196	131503	420699	69
Riche en Eau	115.3	318240	223864	37636	261500	70
Mon Trésor	101.7	280680	197081	39595	236676	70
Savannah	108.9	300600	203492	81759	285251	68
Rose-Belle	92.2	254520	152144	59776	211919	60
Britannia	79.7	219960	144411	60486	204897	66
Union St Aubin	110.9	306120	266738	5066	271804	87
St Félix	57.9	159840	56504	82494	138998	35
Bel Ombre	70.8	195360	87254	74133	161387	45
Réunion	99.5	274560	137665	71063	208728	50
Highlands	98.0	270480	123386	74591	197977	46
Mon Désert	136.1	375600	210064	109581	319645	56
		6510360	3673890	1979848	5653738	56

SOURCE: (1) K Lutchmeenaraidoo et al: Committee of Enquiry (Sugar Industry) 1972. (2) Annual Reports Mauritius Sugar Industry Research Institute.

T.C.H. = Tons of Cane per hour.

1. The 1972 crop produced the largest ever tonnage of cane in the island. The 1972 crop was also the longest one on record with an average of 132 crushing days.

2. Average 1971 - 1975.

What we have said above regarding the economic aspects of the relationship between millers and planters should provide a convenient background for the study of the institutional aspects of those relations. In the rest of the chapter we shall study the system of payment by factories for planters' canes; we shall also consider the characteristics of the small planters' class in the island. Finally we shall provide a schematic framework for the study of the possible effects of technical and institutional factors on small planters' costs and profits.

(4) The System of Payment for Planters' Canes

Historically cane planters have played a leading role in the island's social and economic development.[1] The large majority of the planters are Hindus, the descendants of the indentured labourers, who came to the island to work on the sugar estates. Gradually they acquired land and formed a class of small cultivators and developed a new type of relationship with the estates. As suppliers of cane to the factories, their interest often clashed with those of the millers; this gave rise to a situation of latent and sometimes overt conflict between them and the estates.[2,3]

The/.....

1. See below Chapter 2 page
2. This economic antagonism should be seen in the context of the underlying "conflict situation" which characterises the relation between the different ethnic groups in the island. See below Chapter 2 page
3. There was violent unrest on Sugar Estates in 1937 in which four persons died. The immediate cause of the disturbances was a reduction in the price paid by estates for a particular variety of cane grown by small planters. A detailed account of these disturbances will be found in the Report of the Commission of Inquiry into the Unrest on Sugar Estates (1937). Part I (III).

The increase of Indian cane land and the emergence of a sizable group of independent cane producers, coupled with a steady increase in the capacity of the sugar mills created a brisk demand and intense competition among estates for planters' canes. Eventually the mill-owners came to an agreement whereby the cane cultivated in a specific area could only be processed by a certain factory. The system was not always effective and it was not popular among planters "who considered that they had no voice in the matter."[1]

Following the recommendations of the Commission which enquired into the unrest on sugar estates in 1937, an organisation called "The Central Cane Aribtration and Control Board" (commonly known as the Central Board) was established. Each factory was assigned by law a particular area outside which the miller may not purchase and the grower may not deliver canes. In determining factory areas the Board has one main object in view: the transport of canes over the shortest possible distance.[2] It also

takes/...

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1. J R D'Avice: The Central Board, in the Mauritius Chamber of Agriculture 1853-1953. pp.163-164.

2. Before the organisation of the cane market and the establishment of factory areas, planters' canes were sometimes transported over long distances to supplement a factory's own cane crop. In 1937, for example, Sans Souci factory was purchasing a low-yielding variety of cane, the Uba, on which the cost of transport was Rs 1.50 per ton. The average amount of sugar produced from that cane was 88 kgs per ton, out of which the factory was giving 70 kgs to the planter and retaining only 18 kgs. The return to the factory from processing the cane (at the then prevailing sugar price of Rs 12 per 100 kgs) was Rs 2.16 per ton of cane processed. The cost of processing a ton of cane - including the cost of transport - amounted to Rs 4.30. Transport costs thus amounted to 65 per cent of the total cost of production. As a result Sans Souci factory was losing Rs 2.14 on each ton of Uba cane(a). Even today cane transport costs may be an important limiting factor in the process of rationalisation of sugar factories in the Island.(b)

   (a) Report of the Commission of Inquiry into Unrest on Sugar Estates: Op.cit. Part V (11) pp 136/137.

   (b) Mauritius Chamber of Agriculture: Improving Relations between Millers and Planters: Op.cit. 2.14. But transport costs may not be so important as to outweigh the advantages of rationalisation. See J M Paturau: Les Economies d'Echelle dans l'Industrie Sucrière: Op.cit. p.3

takes into consideration the amount of canes delivered to each factory, the right of ownership and the existence of contracts and goodwill. The boundary of factory areas may be varied at any time by the Board on the grounds of changes or alterations in these conditions. Planters are paid according to the guiding principle that the average amount of sugar which they might expect to receive for their canes would not be less than a specified percentage of the amount which a ton of such canes delivered at the factory may normally be expected to yield.[1] These arrangements however did not resolve the problem of devising an equitable method of payment for planters' canes or eliminate the causes of conflict between millers and planters,[2] which has marked the development of the island sugar industry. On a number of occasions - 1937, 1950, 1963 and 1972 - Government had to intervene in order to settle disputes between the two parties and various amendments were made on these occasions to the method of control and the basis of apportionment of sugar between millers and planters.

The current regulations governing the sale of planters' canes are contained in the Sales of Canes (Control) Ordinance 1974; the quantity of sugar which planters shall be entitled to receive shall not be less than 72 per cent of the quantity which such canes delivered at the factory over the period may normally be expected to yield, according to the average

efficiency/...

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1. J R D'Avice: The Central Board. The Mauritius Chamber of Agriculture 1853- 1953, op.cit. p.167.

2. This latent state of conflict may have sociological as well as economic causes. See Chapter 2, p.65.

efficiency of all sugar factories in Mauritius, or according to the efficiency of the factory where the canes have been crushed, which ever is the higher, in respect of the crop during which the cane has been supplied. In addition the legislation states that planters shall be entitled to not less than 68 per cent of the sugar and molasses produced from their canes.

The principle of a single ratio applicable in all conditions for the apportionment of sugar proceeds between millers and planters has been criticised.[1] It is argued that this formula is not flexible enough to result in an equitable distribution of sugar proceeds over the full range of conditions that may apply in Mauritius, as it does not take into account the important factors that affect milling and growing profitability or the particular price conditions that apply each year.[2] While the returns to millers from processing planters' canes depends on the share of sugar allotted to them and the price of sugar, the cost of processing these canes depend on a different set of factors. That means in effect that an increase in the price of sugar will increase the returns to millers irrespective of the changes which may have occurred in the cost of processing planters' canes. The influence of an increase in the sugar price (ex-Syndicate price) on milling and growing profits is shown in Table 6.

TABLE 6/....

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1. Mauritius Chamber of Agriculture: Improving relations between Millers and Planters mimeo, 1973. See also K Lutchmeenaraidoo "et al", op.cit. Ch 3 pp.25-26.
2. Mauritius Chamber of Agriculture: Improving Relations between Millers and Planters, op.cit. p.2.

TABLE 6 : Comparison of Milling and Growing Profits in Rupees per ton of Sugar Produced

Ex. Syndicate Price	Milling	Growing
600	35.4	62.4
625	42.3	79.1
650	50.2	96.5
675	58.1	113.6
700	66.0	130.8
725	73.9	147.9

SOURCE: Mauritius Chamber of Agriculture: Improving Relations between Millers and Planters. Op.cit. p.12.

"In these circumstances it would seem sensible to base the apportionment system on an evaluation of the actual financial results achieved by the milling sector each year and to enable the growing sector to receive more than its minimum share of sugar proceeds in those years when the profitability of milling would be above a predetermined level".[1]

A similar point was made by the Committee of Enquiry (Sugar Industry) 1972-73. The Committee argued that the division of proceeds in a constant ratio, , regardless of cane quality, cost of conversion of cane into sugar and the realisation price of sugar, did not constitute in its view a rational sharing of the proceeds as the value of sugar accruing to the miller from processing a unit weight of growers' canes ranged within very wide limits.[2]

As we have/....

1. Mauritius Chamber of Agriculture: Improving Relations between Millers and Planters. Op.cit. p.2
2. K Lutchmeenaraidoo "et al": Committee of Enquiry (Sugar Industry) 1972-73. Op.cit. Ch 2 p.14.

As we have seen above the amount of sugar accruing to the planters depends on the efficiency of factories. In this connection it has been argued that all planters should receive the same revenue per ton for cane of equal quality, irrespective of the factory area to which they belong.[1] The amount of sugar that could be extracted from a particular load of cane could vary by 8 - 9 per cent between the most efficient and least efficient factories. Between 1970 and 1975, 9 factories out of 21 were below the average island-wide efficiency.[2]

But there is another, perhaps more fundamental point concerning the basis of apportionment of sugar between millers and planters. It relates to the variations in the proportion of planters' canes in the total supply of cane processed by individual factories, hence the varying importance of the contribution made by "outside" planters to the profitability of the different factory estates.[3] As detailed cost accounts are available for each factory in the island, it would be relatively easy to determine the reduction in unit cost achieved by each factory by processing planters' canes. In the conditions of general excess capacity[4] which characterise the cane sugar factories,

due to/...

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1. Mauritius Chamber of Agriculture: Improving Relations between Millers and Planters, op.cit. p.6.
2. Efficiency is measured here in terms of the rate of sugar recovery. The average rate of recovery for the whole island was 86.7% of the sugar in the cane with a range between 80.9% and 89.3%. Source: Annual Reports Mauritius Sugar Industry Research Institute.
3. See above page 38 Table 5.
4. Excess capacity is defined here as the difference between the Minimum-cost quantity and the actual quantity of cane processed.

due to the relatively short duration of the crushing season, we would expect the average processing cost of each factory to drop substantially as the volume of cane processed increases, independently of differences in the capacity of factories.[1] The greater the proportion of planters' canes processed, the greater the cost reduction achieved in processing these canes. It is clear from Table 5, that the cost reduction may be quite substantial in certain cases.

This implies that in given price conditions the average profitability of factory operations increases substantially with an increase in the volume of cane processed. The benefits accruing to different factories from processing planters' canes, will thus be closely related to the proportion of cane processed.[2] As the price paid to growers per ton of cane processed is uniform throughout the island, we conclude that this price does not reflect accurately the benefit accruing to individual factories from processing planters' canes. The present system of apportionment thus prevents the benefits of the important increasing returns that exist in sugar processing from being passed on to "outside" planters, who produce between them 36 per cent of the total cane production. This makes for a less rational use of resources in the industry as a whole to the extent that the production of cane by planters

will tend/...

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1. See above pages 34 and 35, Ryland's regression results for Queensland factories.
2. See pages 34 and 35 above, Ryland, op.cit. for an estimate of the regression coefficient of the volume of cane processed on the average cost of factory operations.

will tend to be below its optimum level from the industry's point view.[1]

Thus as we have seen above the share -out of proceeds between millers and planters - the price paid to factories for planters' canes - depends on a complex combination of institutional and economic factors. These factors will determine the income accruing to planters and, in given cost conditions, their optimum level of output. They will thus influence the tonnage of cane produced by them.[2] As many small planters also work as labourers[3] the income received from their cane plots may influence the supply of their labour

to the/...

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1. Below what the profit maximising level of output would have been if a certain part at least of the benefits of increasing returns, or falling average costs, were passed on to the outside planters in the form of higher cane prices. We deliberately ignore the other problems to which such a policy might give rise.
2. There is evidence to show that small planters in Mauritius tend to react quickly to changes in price. For example, the high sugar prices that prevailed after the First World War brought an important increase in the amount of cane land belonging to Indians and in the tonnage of cane produced by them. In 1911, Indian cane planters cultivated 33 per cent of the total cane land; in 1922 they cultivated 46.2 per cent of the total cane land in the Island. Likewise the sharp drop in the price of sugar after 1927 lead to a rapid decrease in Indian cane land. Between 1922 and 1932, the total acreage under cane dropped from 146,000 arpents to 128,339 arpents a drop of 12 per cent approximately; over the same period Indian cane land fell from 46.2 per cent to 36 per cent of the total acreage. Just as the Indian planters were quick to expand their output of cane in response to high sugar prices after the First World War, so the low price of sugar and the corresponding fall in the price paid by factories for planters' canes brought a sharp curtailment of small cane farming in Mauritius. R Lamusse: The Economic Development of the Sugar Industry. Unpublished, B Litt thesis - Oxford, 1958, Ch 2 p.66.
3. See below Chapter 5, Part I, pp.339/340.

to the estates.[1]

We have considered the institutional and economic aspects of the relation between millers and planters and their influence on the cost of cane cultivation and sugar production in the island. We shall now study the characteristics of the small planters class.

(5) The Characteristics of the Small Cane Planter[2]

There are fundamental differences between miller planters and large planters on the one hand and small planters on the other, especially those 27,000 small planters who each cultivate less than five arpents of land. These differences are reflected in differences in the method of cultivation and yields. The differences in the method of production between the two categories of planters reflect in turn differences in the socio-economic environment of small planters as compared with that of millers. They will have an important bearing on the yield and profitability of small plantations and, by extension, on the profitability

of the sugar/....

1. For a simple analysis of the effect of an increase in rent income on the farmers' labour supply, see C E Ferguson and J P Gould, op.cit. Ch 15 pp.431, 432. In 1972, 60 per cent of the small planters (cultivating less than 100 arpents) considered the income received from their cane plantation to be unimportant.

2. The great majority of agricultural labourers in Mauritius belong to the same Indian rural stock as the small planters and their profile and characteristics are closely akin to those of the planters. The portrait and background of the planter given in the following pages will also be that of the agricultural labourer. In fact both categories overlap to some extent and each group will naturally turn to the other for support in furthering its claims.

of the sugar industry as a whole.[1] The information given below is derived from a Survey carried outby the Ministry of Agriculture and Natural Resources in 1972.[2]

The Profile of the Small Planter:

(i) Age: Half of the total number of planters are over 50 years old, as compared with 13.4 per cent[3] for the total population. Age is considered to be an important indication of the attitude and motivation of planters towards change and improvement.

(ii) Education: Thirty-seven per cent of the planters have not been to school and another thirty-eight per cent have not completed their primary education. Thus three quarters of the population of planters may be considered to be illiterate. Education is an essential element in the process of modernisation of society.[4] It will have a strong influence on a person's behaviour and acceptance of change.

(iii) Occupation: It is obvious that with 27,000 out of 30,000 planters cultivating less than five arpents of land, and half of them cultivating less than one arpent, the majority of cane planters must find supplementary sources of income.[5] In 1972, 62.3 per cent of them had other occupations. 60 per cent of the planters with other occupations,

considered/....

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1. On page 55 we present an outline of the system of institutional and technical relations within which small planters operate. It also illustrates the network of technical and institutional linkages between small planters and their environment.

2. Ministry of Agriculture and Natural Resources (1973) Survey of Sugar Cane Planters ... Op.cit. Ch 3.

3. (Please see footnote next page).

considered their revenue from sugar-cane as unimportant. The importance of revenue must be an important consideration in the drive for higher cane yields.

(iv) Fragmentation of holdings: Large families and inheritance laws have led to the excessive fragmentation of holdings. Thus to the problems of small size is added that of scattered holdings. It was found in the 1972 survey that forty-three per cent of planters with less than five arpents of land cultivated more than one plot of land in the same factory area while many planters have plots in more than one factory area, and consequently have their canes processed in more than one factory.

We have said above that the cultural practices of small planters differed substantially from those of estates. Information was obtained in the Survey regarding the methods followed by small planters in the major areas of cultivation such as weeding, fertilisation, the cane planting cycle and distribution of cane varieties. It was thus found that in 78.5 per cent of the cases fertilisation was inadequate or poor; while 21 per cent of the fields were

not properly/...

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3. Average 1975-1979.
4. See above Introduction page2.
5. According to a Report published by the Mauritius Chamber of Agriculture, planters cultivating less than 4 to 5 arpents of land do not earn enough from their plantations to support their families.

not properly weeded. Finally 29 per cent of the planters had less than 75 per cent of their cane land under the recommended varieties.[1] On the other hand 90 per cent of the planters followed the recommended planting cycle.

With regard to managerial ability,[2] the bulk of planters fell in the intermediate class between those with high and those with low ability. Besides it was found that one-third of the planters, do not make use of any credit facilities and do not believe in forming organised groups for a better access to available technical services. Finally two-thirds of the planters were reported to be satisfied with only a primary education for their children.

In the preceding section we have outlined a portrait of the small planter on the basis of information about his attitudes and behaviour, and his cultural methods. We shall now briefly consider the characteristics of small cane holdings. This information is obtained from the survey of sugar cane planters referred to above. Agro climatic conditions have an important effect on yields.[3] They determine in conjunction with the technology of cane production and price of cane, the profitability of small plantations. As we have seen above many planters also work as

labourers/....

1. In the case of cane varieties grown, the degree of technical efficiency is measured in terms of the percentage of land cultivated with recommended varieties.
2. The planter's managerial ability was measured by means of an index based on the following factors: (1) keeping of records; (2) knowledge of varieties; (3) source of planting material; (4) method of land preparation; (5) rates and time of fertiliser application.
3. For the influence of agro-climatic conditions on cane yields on estates, see below Chapter 5, Part 2.

labourers and the income they receive from their cane plantation may affect the amount of "outside" work they are prepared to do.[1]

Thirty-one per cent of the small plantations are situated in the sub-humid region with less than 80 inches of rain. Most of the planters' fields have not been derocked.[2] Seventy-eight per cent of the plots are planted with "inferior" cane material obtained outside the sugar estates or government nursery, which are the acknowledged sources of supply of better quality material. Virtually all the plots (97.8 per cent) in the sub-humid region are not irrigated.

The picture/....

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1. A sharp rise in the cost of labour coupled with the high sugar prices obtained after 1972 may partly explain the reduction in the output of foodcrops in the island. Except for potatoes and peanuts, they are mostly produced by small farmers and vegatable gardeners, many of whom also work as labourers in the sugar industry. For an analysis of the relation between cane yields and sugar prices and the supply of labour on estates we can use a simple model of the behaviour of a farmer as producer and consumer-labourer. (C E Ferguson and J P Gould, op.cit. Ch 15 pp.426-434.) According to this model the amount of wage work which the farmer-labourer will be prepared to do will depend on the income obtained from his farm, his labour - preference function and the wage rate. The shape of the labourer-consumer preference function in turn will depend on his dislike of work as a labourer.

   In that regard, S Marglin has argued that employment carries with it obligations beyond mere field labour; economic relationships cannot be divorced from social and political relationships. To avoid the stigma attached to working for another, the small landowner or tenant may choose to depress the "internal" margin of labour productivity below the "external". S A Marglin: Value and Price in the Labour-Surplus Economy. Op.cit. Ch2 p.1.

2. Derocking was found to have significant influence on yields in the humid region, but not in the sub-humid.

The picture which emerges from the above profile-portrait of the class of small cane planters is that of an elderly tradition-bound and relatively uneducated category of part-time farmers working uneconomical plots of land, many of whom are unaware of and indifferent towards improved methods of cultivation; and reluctant to spend beyond their own limited sources of income for the improvement of their land and the betterment of their cane crop. The small size and fragmentation of individual holdings militates against the use of technically more efficient methods of cultivation. "For very small owners of agricultural land, cane is planted to occupy the land and is allowed to grow as best as it can. It would be unrealistic to expect such areas of land to produce good crops of cane."[1]

The cost and profitability of cane production depends on a number of exogeneous and endogeneous factors.[2] Besides the agro-climatic conditions which exert a strong influence on the tonnage of cane produced and cane quality,[3] these factors comprise the structure of land ownership, sugar cane technology, factory efficiency and the price of sugar. The structure of land ownership is characterised by a high degree of land concentration at one end and a large number of micro-units at the other. This pattern of land distribution, influences the distribution of

capital/.....

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1. Ministry of Agriculture and Natural Resources: Survey of Sugar cane planters - op.cit. Ch 3 p.14.
2. The term "exogeneous" denotes those factors which affect other variables within the system but are not affected by them. The term "endogeneous" denotes those factors which are determined within the system.
3. See below Chapter 5, Part 2, page 357.

capital and labour resources within the industry and the choice of production technology.[1] Cane agronomy - the choice of cane varieties and their characteristics - in conjunction with natural factors will influence cane quality and the amount of sugar recovered from cane, hence the amount of sugar accruing to the planters. Finally the price of sugar will determine the financial results of the crop and the income accruing to the planters. This shows that the rate of output and profits on small plantations are fairly rigidly determined by a mix of technical, institutional and economic factors on which the individual planter has no control and that his decisions may have a limited influence on the ultimate results.[2] Clearly this situation must have a strong bearing on planters' attitude towards risk which may militate against innovations even when these measures may appear economically profitable.[3]

Seen in/....

1. By production technology we mean the combination of land, labour and capital inputs used in cane production.

2. Range of Fluctuation of Key Economic Variables, 1972-78

Variable	Maximum	Minimum	Average	Range of Fluctuation
Ex Syndicate price	Rs2436/ton	Rs685/ton	Rs1560.5 ton	± 56.1%
Cane harvest (million tons)	6.40	4.32	5.36	± 19.4%
Sugar recovered % cane	11.68%	10.63%	11.15%	± 04.8%
Total sugar produced	718.5	468.3	593.3	± 21.1%

SOURCE: Annual Reports, Mauritius Chamber of Agriculture.

3. M P Todaro: Economics for a Developing World, Op.cit. (1977) Ch 16. For a more detailed analysis of the farmer's process of decision making in face of uncertainty, see R H Day and I Singh. Economic Development as an Adaptive Process. The Green Revolution in the Indian Punjab. (Cambridge University Press, 1977. Ch 2, pp.19-33.)

Seen in this way the individual small planter appears like a very small cog in the organisation and operation of the sugar industry. Yet as a group small planters cultivate 43 per cent of the cane acreage and produce 36 per cent of the total cane output. These small planters also play an important part in the island labour market, and account for a large part of the sugar industry labour force in their dual capacity as owner-cultivators and as suppliers of labour to the estates.[1] The income from their plantations will influence both their demand for outside labour and the allocation of their time between their own plantations and the estates and, in that way, may influence the labour supply conditions inside the industry.[2]

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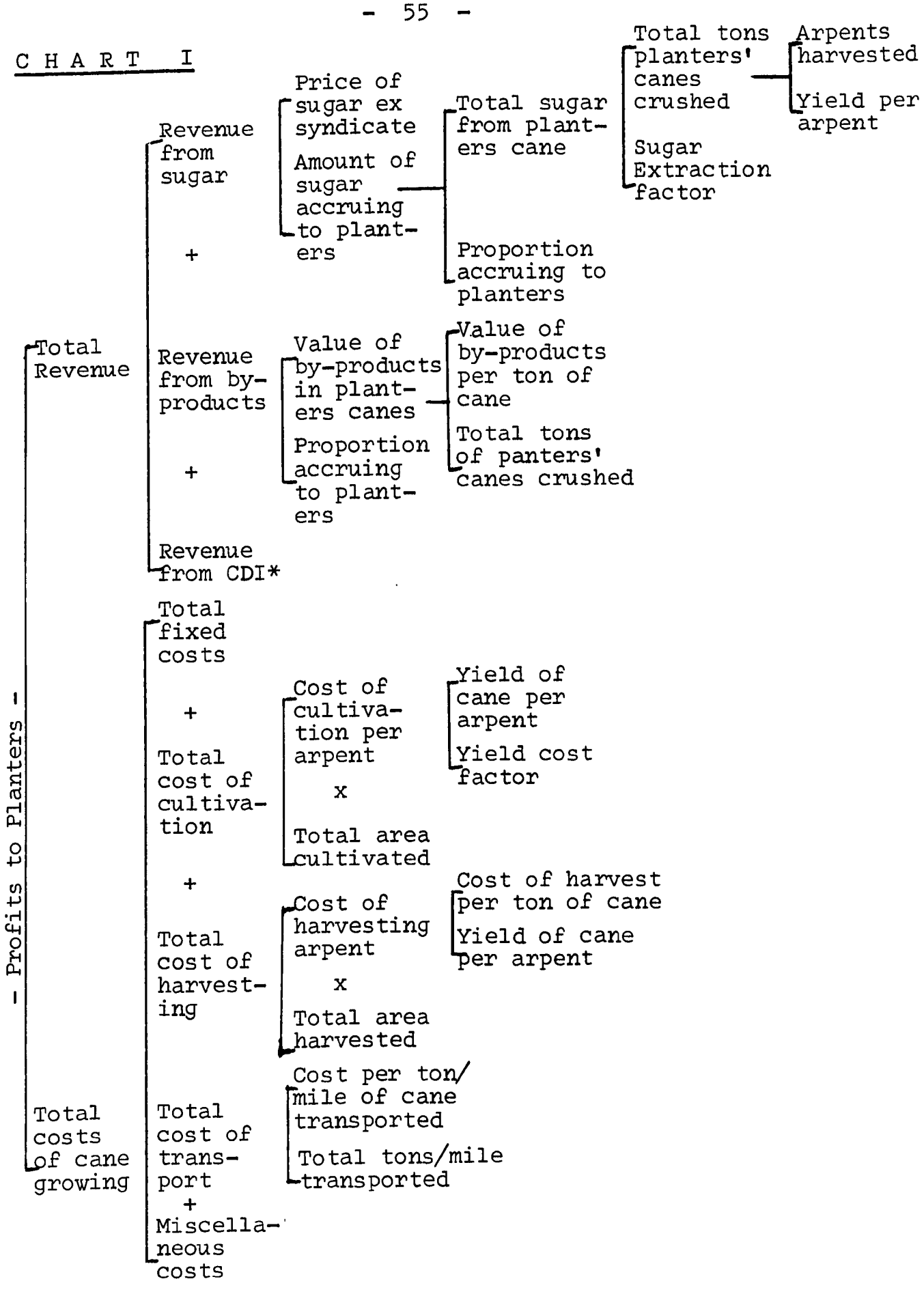
1. From the available data it would appear that about 10,000 small planters work as labourers on the sugar estates: on the other hand planters cultivating less than five arpents employ only a small amount of outside labour.

2. C E Ferguson & J P Gould: Micro-economic Theory, op.cit. Ch 15 15.1.b. pp.427, 428.

C H A R T I



*CDI = Cyclone and Drought Insurance.

This model is adopted from McKinsey & Company Inc. The role of the sugar industry ... op.cit.
A similar model can be used to analyse the profits accruing to other categories of producers: Estates and large planters, from cane growing.

CHAPTER 2

LABOUR POLICY AND THE PLANTATION SYSTEM

Introduction

Economic forces do notoperate in a vacuum but within a given socio-political and economic environment, and economic theory has often been formulated with reference to a particular situation or group of events. A theory however requires a certain degree of generality; we must be able to abstract from a given situation in order to derive certain general principles and hypotheses. In order to formulate a valid model it is necessary to eliminate "local" situations and issues; this presupposes that we must be able to identify them and assess their influence on the problem at hand. Likewise, in applied work, the analysis of/an economic problem requires an understanding of the environment in which the problem is situated. According to G L Beckford studies of development in third world countries have tended to gloss over the institutional differences between the developing and more advanced countries and to apply "western" concepts and solutions to fundamentally different situations.[1]

This chapter/...

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1. G L Beckford: Persistent Poverty: Underdevelopment in Plantation Economies of the Third World, OUP 1972. Introduction p.XIX.

   Beckford may in turn be blamed for having overstressed the importance of specific factors in his analysis of underdevelopment in plantation economies and "made the facts fit the model" rather than the other way round as it should be.

This chapter seeks to identify and analyse the mainforces which led to the direct intervention of Government inthe sugar industry labour market in 1963. These forces were both economic and political. Our analysis of the motives behind the introduction of minimum wage legislation on sugar estates will endeavour to show how the social and institutional factors activated and reinforced the forces of change which found expression in the 1963 Wage Regulation Orders.

The Plantation System

Mauritius has a plantation economy. The term 'plantation' describes a particular type of agricultural organisation which is commonly found in tropical and sub-tropical regions. It is an economic unit which employs a relatively large number of unskilled labourers in the production of agricultural commodities for export. The characteristics of plantation agriculture are: the large scale nature of field operations, the routine character of the work, the need for an abundant and unskilled labour force, the dependence on the export markets.[1]

The plantation has many dimensions. It is a system of agricultural production and a social institution as well. As a social system the plantation has been compared to a total institution, in which society is organised on the basis of a rigid pattern of functional relations. This gives a general appearance of artificiality to the nature of social exchanges, which are all directed to one common objective: the production of the crop. The plantation thus determines the nature of social

relations/....

1. G L Beckford: Persistent Poverty, op.cit. Ch1 pp.6, 7.

relations and pervades the various aspects of life in the plantation societies.

The second dimension of the plantations, its economic dimension, derives from the fact that plantations were established to produce a tropical crop for sale on the metropolitan markets. Because of its export vocation, the plantation forms part of a much wider economic system. Economically the plantation islands can be considered as part of the metropolitan system and this situation has left its mark on their development. The dualistic nature of the plantation economy reflects the strong influence of the metropolitan trade on local production.

In many instances this export orientation coincides with the foreign ownership of plantations in which case control over the key export sector is exercised by large foreign enterprises.[1]

In Mauritius however, the ownership of plantations is predominantly local.[2] But the difference in the location of ownership and control may be more apparent than real as metropolitan merchants and bankers have played traditionally an important role in the provision of supplies and financing of crop operations. In Mauritius British merchants and bankers have played a very important part in the development of the sugar industry,[3] and the name of large commercial enterprises still bear witness to these once-important metropolitan connections.

J S MILL/...

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1. G L Beckford: op.cit. Ch 1, p.11
2. Lonrho, the large multi-national, owns two estates in Mauritius
3. R Lamusse: The Economic Development of the Mauritius Sugar Industry in Revue Agricole et Sucrière de l'Ile Maurice. Vol. 43 1964, pp.356-358.

J S Mill once described the West Indies as outlying agricultural or manufacturing establishments belonging to a larger community.[1] A similar opinion has been voiced more recently by H Brewster,[2] who expressed doubts about the extent to which Trinidad could be treated analytically as if it were an economy. In a study of small dependent islands, P Selwyn further elaborated on this point.[3] According to him economic dependence is not confined to the nature of the relations between the plantation islands and the "metropoles" but the islands' own internal economic and institutional structure will reflect that dependence. The same comments could be made about Mauritius.

The plantation thus provides a systematic framework for the analysis of the process of development of the sugar islands; and industrial relations represent an important subset within this system. Our analysis of labour policy in Mauritius must therefore necessarily consider the institutional framework in which it operates.

The Institutional Framework

Our argument has been so far that, in the analysis of economic problems, we must pay attention to the socio-economic and institutional environment in which these problems originate, and secondly, that the plantation system has certain characteristics

which/....

1. J S Mill: Principles of Political Economy, Bk III, Ch 25 referred to by John King in: Mauritius, Malthus and Professor Meade: mimeo. The Institute of Development Studies, Sussex, Footnote 25.
2. H Brewster: The Growth of Employment under Export-biased Underdevelopment: Trinidad (Soc & Econ. Studies, June 1972 p.157).
3. P Selwyn: Small, Poor and Remote: Islands at a Geographical Disadvantage. Institute of Development Studies, University of Sussex, mimeo. p.11.

which differentiate it from other agricultural institutions. We shall now proceed to list down the characteristics of plantation islands.

(i) Economic dualism. A high concentration of land and other resources within the plantation sector. Weak linkages between the plantation sector and the rest of the economy.

(ii) A segmented society, characterised by a rigid class-caste system and reflecting in its structure the predominance of the export crop - in this case sugar - over every aspect of ecomomic and social life.

(iii) A considerable fragmentation of land in the traditional agricultural sector; a large number of micro-units, which provide an economic base for small cultivators who work on estates to supplement their income.

(iv) A highly developed institutional system for the service of the plantation.

(v) The extraversion of political and economic power. External institutions and external factors may have a strong influence on the internal political and economic situation.

(vi) Peripherality and/or insularity. The plantation islands are often situated at a great distance from the "metropolitan" market with which they trade and of which they form part. Thus the problems of small size and insularity are aggravated by problems of location and peripherality.

To the/...

To the above list we should add the following secondary or derived characteristics:

(a) Casual, seasonal employment for a large part of the labour force.

(b) Limited investment and employment opportunities outside the export sector, hence a lopsided economy.[1]

(c) A situation of economic dependence. The most obvious feature of this dependence is the extent to which such countries depend on exports and imports, and the very small control which they have on the terms on which their trade is carried.[2]

(d) A pre-industrial social system characterised by relatively impermeable divisions, an introverted mentality on the part of the different groups, and low social mobility.

(e) Great inequalities in the distribution of income and wealth.

(f) A galloping demography on a relatively static economic base; hence a growing discrepancy between the rate of population increase and the rate of economic growth.

This constitutes a miscellaneous list of characteristics. Many of them are not confined to plantation societies and will also apply to other developing countries: for instance the "enclave" export sector, lopsided economic structure, underdeveloped domestic economy, and rapid rate of population growth. Besides

many/....

1. W A Lewis: Economic Development with Unlimited Supplies of Labour ... in Agarwala and Singh (eds): The Economics of Underdevelopment (OUP) 1968, p.409.

2. P Selwyn. Small, Poor and Remote: Islands at a Geographical Disadvantage, op.cit. p.8.

many/other developing countries would appear to suffer to a greater or lesser extent from the "dependency syndrome". We do not claim that any of these characteristics is unique to the plantation system. Its uniqueness lies rather in the particular combination or "mix" of characteristics which are found in these societies.

We have referred to the small size and peripheral location of many of these islands. They are small in terms of area, population, resources and GNP and their smallness restricts their rate of economic development. Most of them are remote from their main markets and trading partners. Their peripheral situation adds to their natural disadvantages. "Peripheral areas may find their backwardness entranched as a result of their relations with the more centrally located areas."[1]

But more important still is the plantation heritage. They were <u>created</u> but not <u>colonized</u> by Britain, France and other European countries. Everything had/to be imported into the islands - labour, machines, financial capital and technology - in the process of the establishment of the plantations. This gave a certain uniformity to the pattern of settlement of these islands, and their common social, economic, institutional - and in most cases also demographic - background, forms a natural bond between them.

Coercive/....

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1. P Selwyn (1978), op.cit., p.4.

Coercive Conditions under Slavery and Indentures

Historically, slavery provided the most important source of labour for the early plantations. There was, according to E Williams,[1] a symbiosis which linked sugar and slavery together. He argued that the plantation inexorably reduced workers to a servile condition. Slavery also shaped the whole pattern of life in the plantation societies, creating a hierarchy and life style for the whites as well as for the blacks.[2] It left its mark on the attitudes of the people, on the economic and social environment and the nature of group relations. When slavery was abolished the planters looked eagerly for an alternative source of labour, which would fit into the established system. They found it in the "teeming millions" of the Indian subcontinent. Indentured labourers then took the place of the emancipated slaves on the plantations.

Thus the term "plantation system" may be applied to a particular form of labour organisation, as much as it is to a particular system of agriculture. In fact the two are inextricably connected. The plantation provided the institutional framework - "the locus and rules of accommodation" - for the operation of slavery and indentures;[3] while slavery and indentures had an important influence on the development of the plantations.

An important feature of slavery on the plantations was the confinement of slaves "within the stockaded walls of the cane plantation."[4] The slaves represented the main item of capital

on the early/....

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1. H Tinker: A new System of Slavery: The Export of Indian Labour overseas (1830-1920) OUP 1974, Ch 1, p.3.
2. Idem: Ch1 p.4 . 3. G L Beckford: Op.cit. Ch 1, p.9.
4. L Best. A Biography of Labour Caribbean Economy (ISER) Mona, Jamaica 1975. 7. p.151.

on the early plantations and had a status that differed little from that of the livestock. The whole system of law on the slave plantations was designed to defend the planters' right in the ownership of his slaves. But the confinement of slaves on plantations could also be seen as a protective measure on the part of a dwindling minority of white planters to safeguard their authority over a rapidly increasing slave population. Confinement of labour was thus an essential element of control.

The same attitude vis-à-vis the labour force continued to prevail after the emancipation of slaves, among the planters and the authorities. Numerous reports emanating from various colonies substantiate this fact. "The whole trend of labour laws and practice was towards the enforcement of greater control by the employer over the labourer so that he might get more out of his labour for less expenditure."[1] Under slavery men were robbed of their freedom, lost their fundamental rights, became the property of the planter. A similar but more subtle process of alienation of the labour force took place under the system of indentures.

During their period of industrial residence, the indentured Indian labourers were confined by law to the estates and thus isolated - both geographically and socially - from the rest of the community. For most Indians the plantation remained the boundary of their existence. Although the labourer was bonded to the estate for a term of years, the plantation held most of them for life. The legacy of slavery, in the Caribbean and the Mascarenes was a new system of slavery, incorporating many of

the repressive/...

1. H Tinker. A New System of Slavery, op.cit. Ch 1, p.17.

the repressive features of the former system, which induced in the Indian labouring population many of the responses of his African brothers in bondage.[1]

The Conflict Society: Cultural Pluralism and Social Integration

The plantation society is a society of transplanted people. This produced a heterogeneous community with different racial and cultural groups living side by side, a kaleidoscope of races and cultures in which class-caste and race differences weaved a very complex pattern. The pattern of immigration and settlement is reflected in the composition of the population which consists of different ethnic groups, that are socially segregated and are brought together only in the sphere of economic activity.[2,3] Plantations have generally given rise to plural societies. "In a plural society ... the community tends to be organised for production rather than for social life."[4] These different groups displayed an inherent sectionalism in their dealings with one another, which tended to emphasize the plural character of the society and aggravate its instability, thereby enhancing the need for it to be held together by some force exerted from outside. Colonisation provided this outside force, but instead of helping to amalgamate the different pieces of

the social/...

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1. H Tinker. A New System of Slavery, op.cit. Ch 1, p.19
2. G L Beckford: Op.cit. Ch 2 p.55.
3. According to Benedict (1959), the pattern and nature of emigration to Mauritius produced a system of social stratification in which certain occupations tended to be the province of certain ethnic groups, although from an early date there was some opportunity for social mobility within each ethnic group. This did not diminish the pluralism of Mauritius; it created an upper, middle and lower class for each ethnic section rather than a single class cutting across all sections. B Benedict. Problems of a Plural Society, op.cit. Ch 3, p.27.
4. J S Furnivall quoted in G L Beckford: op.cit. Ch 3 p.81.

the social jigsaw, it perpetuated the 'status quo' so that these differences and disparities became entranched into the social landscape. But the plantation system also represented a powerful integrative force which held together the various disparate elements of the colonial society.

Another powerful element of social integration was provided by the creation of a creole society. It was the embodiment and outcome of the process of assimilation of the subordinate classes - the African slave and to a lesser extent the Indian labourers - to the ways and habits of the planter. On the plantations, the African slaves came into contact with the white man and his world. They adopted the language of their masters, embraced his religion and culture. The creole society, which is found today in all plantation societies became an instrument of social integration as well as an avenue of social mobility for members of the subordinate group. It became also an instrument of political and social change in these societies.[1]

The Colonial Government and the Plantocracy

The Colonial Establishment from the Governor down to departmental officers would appear to have been more concerned with the administration of the colonies rather than their development. "There was a major defect in British imperialism: this was a bureaucratic stasis which left the British administrators as guardians of the 'status quo' and permitted the continuation of tarnished practices because there was nowhere a sufficiently

dynamic/....

1. G L Beckford: op.cit. Ch 2 pp.41-42.

dynamic spirit to effect change ... This accpetance of things 'because they were there' was arguable the worst feature of imperialism - worse than this heedless exploitation which formed the substitutes for economic development in the empire."[1] This extract aptly summarises the general attitude of British authorities during the period of indentured immigration, an attitude of latent concern, sometimes of strong disapproval in the face of the more blatent forms of malpractices and abuses of the system, which led to periodic restrictions on emigration or attempts to reduce the period of servitude of the labourer on the estate. But the colonial authorities appeared to have been content to lay down formal safeguards but not to interfere in the actual operation of the system. Although direct control over the planter was in legal theory possible, in practice the plantocracy could safely defy the efforts of Whitehall and limit its powers. "In a society where everyone was actively or passively in league with the sugar interests, no outsider, even when armed with the authority of the British Crown could effectively dent the system.[2]

Thus from the beginning, the sugar industry in Mauritius was an exercise in political partnership. The landowners (mainly of French origin) provided the capital and entrepreneurship, the colonial government provided the infrastructure and when it became necessary for the industry's development, an abundant source of labour and the metropolitan government a protected market.[3]

Wages/...

1. H Tinker: A New System of Slavery, op.cit. Preface p.xvi.
2. H Tinker: idem, Ch 1, p.15.
3. John King: Mauritius, Malthus and Professor Meade: The Institute of Development Studies, op.cit. p.11.

Wages and Productivity

Slavery determined the pattern of production on the early plantations. In order to provide work for the slaves all the year round, every operation was reduced to a manual one. Only the simplest tools were used, the hoe to till and weed the land, and the "serpe" or bill-hook to cut the cane. Everything that could be done by animals or machinery was done by human hands.[1]

These/...

1. This argument follows from the profit maximising principle governing the use of factors of production. When he acquired a slave the planter bought a fixed stock of labour. Slave labour had a relatively low marginal cost; this consisted essentially of the cost of food, part of which was produced by the slave himself.(a) The planter's labour policy would be different in that case from what it would have been if labour was hired for a wage. In the first case the profit-maximising principle implies that the slave labour should be used intensively in order to recover the relatively high fixed costs of investment in slaves as rapidly as possible. Thus the 'primum mobile' of the plantation owner was to extract as much work as possible out of the labour force. This led to a system of exploitative authoritarian management which was at its peak on the slave plantation.(b) The same reasoning can be applied 'mutatis mutandis' to the attitude of the planters vis-à-vis the indentured labourers. In order to recover the costs involved in the recruitment and transport of these labourers, the planters tried to get as much work as they could out of them during their period of contract with the estate.

   On the other hand, there is probably a close link between the input of calories and output of work. According to Alan Berg,(c) "the inadequately fed make compensating adjustments in the energy they expend to preserve their natural processes." In this connection G Freyre(d) wrote that in Brazil sugar plantation owners "learned that the energy of the African in their service, when abused or subjected to strain, paid less dividends than when it was well conserved ... which accounts for the plentiful and nourishing food ... the owners (passed) out to their slaves ... The Negro slave in Brazil appears ... to have been with all his alimentary deficiencies, the best nourished element in society ..."

   (a) H Tinker: Op.cit. Ch 1, p.9.

   (b) G L Beckford: Op.cit. Ch 3, p.54.

   (c) D Ah-Chuen, A H Hossenmamode, A K Gujadhur: An Investigation of Factors Relating to Absenteeism among Cane-cutters on the Bel Ombre Sugar Estate: Ch 3, p.41.

   (d) Idem. Ch 3, p.41.

These primitive methods of cultivation were carried on, unchanged, year after year and decade after decade. An abundant and cheap supply of labour was the first condition for the establishment of plantations. It remained the most important feature and the fundamental objective of labour policyin the plantation colonies. As a result wages in the sugar colonies remained virtually unchanged throughout the nineteenth century in spite of a rapid expansion of output.

The fact that the expansion of output which occurred in the sugar colonies - especially the 'new' colonies of Mauritius, Trinidad and British Guana - and the concomitant increase in the demand for labour - had little effect on wages, implies the existence of a large reserve pool of labour. This came about through the large scale introduction of indentured immigrants from India. Between 1843 and 1870, there was a large annual outflow of Indian emigrants to Mauritius and the other colonies. 525,482 Indians went to the British and French sugar colonies during that period. Of these 351,401 - almost 70 per cent - came to Mauritius. Compared with the size of the island population the rate of Indian emigration to Mauritius can truly be described as a human flood.

Thus the sugar estates in Mauritius were supplied with labour from India and the high rate of immigration in the eighteen-fifties and sixties gave the sugar industry in the island for a time the benefit of a virtually unlimited supply of labour. Indian emigration to the other sugar islands was on a more modest scale but was basically subject to the same rules and regulations as applied in Mauritius, and gave rise to the same sort of problems. The history of the indentured immigration

to the/...

to the colonies is a long sequel of recrimination, admonition and sanctions on the part of the British and Indian authorities on the one hand and the colonial authorities and planters on the other.[1]

The coercive labour condtiions which prevailed on estates under slavery and indentures, had an important influence on the system of production, while the cheap labour policy encouraged the wasteful use of labour and a low level of productivity.[2] On the other hand the coercive labour conditions, the drudgery of field work and lack of motivation encouraged malingering or dragging out of tasks, hence the need for ever more stringent control measures. For the productivity of the labour is not independent of its reward and a low wage, and bad working conditions, will generally result in a low level of productivity. The relation between wages and productivity has been expressed by Adam Smith in a well-known aphorism, which aptly depicts the attitude of labourers towards plantation work under slavery and indentures: "The work done by slaves, though it appears to cost only their maintenance is in the end the dearest of any. A person who can acquire no property can have no interest but to rest as much and to labour as little as possible."[3]

We have/....

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1. For a detailed account of Indian immigration, see H Tinker: op.cit.
2. H Myint: The Economics of Developing Countries, 3rd ed. London Hutchinson, 1967, Ch 4 p.56.
3. H Tinker: op.cit. Ch 1 p.8.

We have said above that slavery had a powerful influence on the attitudes and way of life of the whole community. It created a colonial feudalism and a sugar aristocracy. "The proprietors saw themselves as the main stay of the island society; they thought of themselves as aristocrats, like the great whig landowners of England or the "Seigneurs" of France,[1] and spent most of their time and the revenue of their plantations in leading a lavish life in the metropolis. Arthur Lewis, whose model of a labour surplus economy may have been inspired by his own West Indian background, has drawn an important distinction between the prodigal landlords and the thrifty accumulating capitalist. "It is the inequality (of income) which goes with profits, that favours capital formation, and not the inequality which goes with rent ... so much of the rent income is squandered. Behind this analysis also lies the sociological problem of the emergence of a capitalist class that is to say of a group of men who think in terms of investing capital productively. The dominant classes in backward economies - landlords, traders, money lenders ... do not normally think in these terms."[2] This aspect of the Lewis model fits beautifully the situation in the sugar colonies and can explain a good deal of the chronic under-development of the plantation islands. Beckford attributed the underdevelopment of these societies to structural factors.[3] We believe that the problem of underdevelopment may also be explained by the attitudes of the people and the organisation of society in the plantation colonies.

To summarise/...

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1. H Tinker: Op.cit. Ch 1 p.6.
2. W A Lewis: Economic Development with Unlimited Supplies of Labour in Agarwala and Singh, pp.419-420.
3. Please see footnote next page.

To summarise the argument so far, the plantation system established a coercive form of labour organisation under slavery and indentures; under which the workers were confined to estates and denied access to independent means of subsistence; this created an agricultural proletariat in the plantation colonies. The system also encouraged a prodigal use of labour which delayed innovation and technical improvements in field and factory. It had thus a debilitating influence on the economic and social development of the sugar colonies.

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Tumbling Prices and Labour Problems

The first serious challenge to the plantation system in the nineteenth century came with the opening of the British and French sugar market to 'foreign' producers, the development of beet production in Europe and the drop in indentured immigration. These developments put an end to the 'golden age' of the colonial sugar industry. The onslaught of the young vigorous beet industry on the European markets unleashed the forces of change, which destroyed the older plantation order in the sugar colonies. Internally the sugar islands faced acute labour difficulties, as the flood of immigrants turned into a trickle and eventually stopped altogether. Soon the majority of the Indian labour force in Mauritius consisted of old immigrants - many of whom left the estates and a way of life which they abhorred. The attraction of life away from the plantations and among their own kin exercised a strong pull on the Indian labourers. To deal with this situation, and in order to retain

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3. According to Beckford, the plantation system creates important structural biases - a pronounced misallocation of resources, high social costs and vested interests which considerably distort the process of development and curtail the rate of economic growth in these countries, G L Beckford: op.cit. Chapters 6 and 7.

control over the Indian labour force, the authorities launched a crusade against "vagrancy". Ordinance 31 of 1867 decreed a general registration of old immigrants in the island and introduced a "pass system". These passes were required of old immigrants not employed by estates. Those who were caught without their passes were liable to be detained as vagrants.

These harsh measures must be seen, however, in the context of the widespread disruption and distress which followed the outbreak of malaria. In the first six months of 1867, almost one-fifth of the population of Port-Louis died of the fever. But these measures which were directed exclusively at one group, the old immigrants, had economic as well as social motives. They led to widespread unrest. A Royal Commission of Inquiry was apppointed in 1872 and on its recommendation, the pass system was repealed and a new Labour Law was enacted.

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The last decades of the nineteenth century were a period of crisis for the sugar colonies. Different islands coped with the situation in different ways and with a greater or lesser measure of the success. Driven out of the British sugar market by the sharp drop in the London price, Mauritius found an important alternative outlet for its sugar in India. The first shipment of sugar from Mauritius to Bombay took place in 1863. By the end of the century, two-thirds of the island sugar crop was purchased by India.

The adoption by Mauritius of the Indian rupee in 1876, was the logical outcome of the important commercial and business links which developed between Mauritius and India and brought the island increasingly into the Indian economic orbit. The drop in the price of silver relatively to gold gave Mauritius sugar

an effective/...

an effective measure of protection on the Indian market, at a time when the British and French Caribbean islands and Réunion were severely hit by the sharp fall in the sugar price on the European markets. The relative change in the rupee and sterling prices of sugar between 1877 and 1896 is shown in Table 7 below:

TABLE 7 : Index of Sugar Prices in Bombay, Mauritius and London 1877-1896 (Average 1877-79 = 100)

Year	Rupee prices Mauritius No 1 Sugar in Bombay	Rupee prices of first white crystallised sugar in Mauritius	London Sterling price Clayed Manila
1877	110)	92)	116)
1878	93) 100	90) 100	92) 100
1879	97)	118)	93)
1880	109)	95)	90)
1881	98) 101	95) 95	87) 90
1882	96)	95)	92)
1883	90)	95)	91)
1884	86) 82	74) 82	56) 68
1885	69)	77)	57)
1886	72)	71)	52)
1887	69) 70	71) 71	50) 54
1888	68)	71)	59)
1889	75)	83)	72)
1890	73) 71	74) 76	60) 65
1891	64)	71)	62)
1892	74)	92)	60)
1893	86) 79	71) 77	64) 59
1894	77)	69)	52)
1895	72)	68)	46
1896	71) 71	62) 65	

SOURCE: Royal West Indian Commission, 1897.

Cane/...

Cane Farming and 'Morcellement'

This combination of events led to the demise of the old individual properties. They belonged to a system based on a large servile labour force, simple technology and sheltered markets. When these conditions changed the small archaic mills disappeared and their replacement by larger factories led to the separation of field and factory processes. An increasing proportion of the cane processed by these factories were produced by 'independent' planters while the bulk of the labour force now lived outside the estates. This marked the origins of a labour market in Mauritius.

The process of 'morcellement' began in 1870 and became important after 1880. Under the pressure of falling sugar prices and labour difficulties, many estates released part of their land which was acquired or leased by Indians. In 1892, small farmers cultivated one-fifth of the total cane acreage in the island. Fifty years later they cultivated about fifty per cent of the acreage under cane.[1]

Thus, the process of change which transformed the small primitive sugar properties into larger and more efficient units, gave birth to a new class of small cane cultivators, a neo-feudalism, side by side with the development of a modern capitalist sector. These small cane cultivators constituted a reserve pool of labour to which estates would turn during the crop season when additional hands were required on the plantations. According

to some/...

1. This refers to the total area under Indian cane cultivation. This term covers different categories of holdings including a few large estates belonging to Indians. However separate figures are available for a few odd years, which indicate that the bulk of Indian cane land belonged to small planters. V Nababsing and R Virahsawmy in R Virahsawmy (ed.): Characteristics of Island Economies, University of Mauritius (1977), p.43.

to some writers, the process of morcellement formed part of a deliberate attempt by estates to retain their control over the labour force by the creation of new land-owning proletariat.

The creation of a class of small cane cultivators however may be seen as the logical outcome, both from the point of view of the estates and the small planters themselves, of the conditions prevailing in the sugar industry in the last decades of the nineteenth century. An inveterate dislike of plantation work on the part of the labourers, rising labour costs, falling sugar prices, land shortages and unemployment, all those conditions tended to favour cane farming over other forms of labour contracts in rural labour markets.[1]

Price fluctuations are a common feature of agricultural markets generally and commodity markets in particular. They are the source of much uncertainty in agriculture. The creation of a class of independent planters enabled the estates, to spread the risk attendant on product and factor market instability. If the sugar price falls, there will be a corresponding drop in the price paid to planters for their cane, and, in that way, part of the short-fall or loss incurred by estates will be passed on to the planters. Thus the small farmers played the role of "shock absorbers" by bearing part of the risks involved in sugar production.

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We must/...

1. N Stern: "On Labour markets in less developed countries", paper prepared for the Development Research Centre of the World Bank. Mimeo, Ch 4 p.46.

We must now pause briefly to consider the social and political consequences of the large-scale transfer of land to the labouring classes and the emergence of a class of small cane cultivators in the island. We have seen that an important feature of the indenture system was the confinement of labour on plantations. As long as they lived on estates, the Indian labourers formed a separate group with no roots in the island society. But after they left the estates at the completion of their indentures, the Indians recovered their identity and began a new existence independently of the plantations.

The Indian is a peasant at heart. As early as 1867, fifteen to twenty years after the peak immigration period of the eighteen fifties, there was found in almost every district of Mauritius innumerable Indian market-gardeners and small farmers, "whose provision grounds covered the valleys and terraced the very slopes of Mauritius."[1] The parcelling-out of estate land transformed the Indians from their earlier subordinate status of bonded laboirers into a new class of independent cane farmers or sharecroppers. Thus the transfer of land to the labourers, by providing them with a means of social and economic mobility, presented a challenge to the island's political, social and (more ambiguously) economic structure. For a long time, however, the determined opposition of the Plantocracy kept the island in a sort of political limbo. As time went on, however, the institutional system became increasingly maladjusted to the internal social and political realities. The effective political and economic power remained in the hands of the plantocracy, while a large part of the land had passed into the hands of the

labouring/....

1. Charles Bruce: The Evolution of the Crown Colony of Mauritius. Scottish Geographical Magazine (Edinburgh: 1908), Vol.24,p.71.

labouring classes. In that situation of growing internal stress, the island drifted into the economic depression of the nineteen-thirties.

The economic difficulties of the so-called "lean years" hit every section of the community and brought widespread misery to the labouring population in the island. Their effect was rising unemployment and mounting political and social discontent which exploded into industrial and social unrest. Violence broke out on estates in 1937.[1] These disturbances brought the nineteenth century to a close and heralded the birth of a new era for labour. The stage was now set for rapid changes in the political and social set-up in Mauritius.

The Wind of Change

The plantation as a system has been at the centre of political and social change of one kind or another. Stimulus from outside, response and reaction have characterised the whole history of the development of plantations. The second world war was followed by radical constitutional changes in British colonies, at a time when the population explosion was forcing these countries out of the situation of low-level equilibrium in which they had remained locked for several decades. The post-war political history of the British sugar islands is dominated by the rapid thrust towards independence, and economically by threat of overpopulation, massive unemployment and poverty.

The two/...

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1. Labour unrest also occurred at that time in other sugar colonies namely, Jamaica and Trinidad.

The two major factors which had a determinant influence on the post-war transformation of the Mauritian society were: (1) the rapid movement towards self-government and independence "with all the strains which this must bring in a multi-racial community"[1]; and (2) the elimination of malaria ... which had a dramatic effect upon the growth of population. We shall now outline the constitutional changes which provide a natural background for the analysis of the postwar development of labour policy and industrial relations in the island.

Constitutional Changes

There were three milestones in the march of the island towards independence: the 1947, 1958 and 1967 constitutions. The 1947 constitution marks the beginning of a period of political emancipation which was to lead Mauritius to full independence twenty years later. The amendments that were made to the existing (1885) constitution started a political tidal wave based on the Indian vote, which was to sweep the island rapidly and inexorably forward towards independence.[2]

Before 1947, the island's political system was governed by the 1885 constitution, which provided for very limited franchise. The Council of Government was the deliberative body and consisted of twenty-eight members of whom ten were elected.[3] Its role was to advise the governor in the conduct of the affairs

of the/....

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1. J E Meade: Population Explosion, the Standard of Living and Social Conflict. Economic Journal Vol.77 (June 1967) p.245.

2. L Favoreu: Institut International d'Administration Publique (1970) II p.25. "L'Ile Maurice".

3. The principle of the election of members to the Council of Government represented at the time an important step forward. That measure led to the creation of political parties and had an important impact on the island's political development.

of the colony. The right of vote was restricted by means of a high qualification franchise. Political power was vested in the plantocracy of sugar estate owners and large merchants, who exercised a strong influence over the political affairs of the colony.

The nineteen-twenties and thirties saw increasing pressure for constitutional changes and wider representation reflecting the changing social and economic conditions and rising aspirations of the local population.[1] These pressures were organised by, and found political expression in the newly-formed labour party which became a dynamic force in local politics. However serious labour unrest on estates in 1937, the outbreak of the war and the opposition of local plantocracy delayed constitutional changes. The 1947 constitution was essentially the work of the Colonial Office which decided to introduce a vast programme of constitutional reform in British colonies.[2]

The new constitution established a Legislative Council of thirty-five members comprising nineteen elected members. This measure was accompanied by a substantial lowering of electoral qualifications which considerably enlarged the size of the electorate from 12,000 to 71,000 voters. The 1948 elections saw the victory of the Labour party, representing the poorer urban and rural classes, which established its hegemony over the island politics.

The second/....

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1. S Moody 'et al': Part III p.62.
2. The opposition of the Council of Government to changes in the existing constitution is described at length in the Report of the Commission of Enquiry (1937) Part II pp.62 and 70 "et seq".

The second important landmark, the 1958 constitution, introduced universal suffrage - one man, one vote - and established an Executive Council with a large majority of unofficial members (9 out of 12). It marked the beginning of parliamentary government in the island. In the ensuing (1959) elections the Labour party won an overwhelming victory and further consolidated its leadership and domination over the island politics. There followed a rapid acceleration of the island's political and constitutional development. In February 1964, Mauritius was granted internal self-government. The Legislative Council became the Legislative Assembly, the Executive Council became the Council of Ministers and the leader of the majority party in the Assembly became Premier.

A new constitution was adopted in 1966, which set the final stage for independence. General elections were held in August 1967, which took the form of a national plebiscite on the issue of independence. The pro-independence parties - consisting of the Labour party and its allies - won the elections and Mauritius became independent in March 1968.

The Population Explosion

The second major factor in the process of change after the war was the population explosion which followed the eradication of malaria in 1948. The up-surge of population was as sudden and dramatic as anywhere in the world. Its impact on the island economy can be gauged from the following figures. During the eighty-three years from 1861 to 1944, the island population increased by about 35 per cent altogether. But the increase after 1945 was dramatic: the population grew from 419,000 in

1944 to 682,000 in 1962 and 826,000 in 1972. Thus the population virtually doubled in twenty-eight years. The crude birth rate (CBR) rose to a peak of 49.7 in 1959 - thereafter declining steadily and fairly rapidly to its present level of 25.5 (average of 1975-77), almost half the 1950 rate. The crude death rate (CDR) on the other hand, dropped from 36.1 in 1945 to below 8.0 today. The result was a "runaway" growth of population.[1]

T A B L E 8 : Mauritius: Birth Rates, Death Rates and Rates of Natural Increase: 1959-72 (0/00)

	1950-54	1958	1962	1966	1970
C.B.R.*	46.2	40.4	38.0	34.9	26.0
C.D.R.*	15.1	11.7	9.3	8.8	7.8
R.N.I.+	31.1	28.7	28.7	26.1	18.2

* Birth rates and death rates refer to the number of births and deaths per 1,000 of corresponding population.

\+ Rate of natural increase = Birth rates - death rates.

SOURCE: Central Statistical Office.

The post-war population explosion profoundly disturbed the current economic situation and long term prospects. Before 1945, Mauritius had experienced a slow and unstable rate of economic growth, which depended closely on the proceeds of the annual sugar crop and roughly matched the very slow rate of increase

of the/....

1. According to population projections contained in the Meade report (1960), if fertility rates remained at the current level and, if at the same time, the progress of medicine brought mortality down to a level comparable with that in medically advanced countries, the population would rise from its 1960 figures of 600,000 to no less than 3,000,000 by the end of the century, a projected fivefold increase in 40 years and a 'truly terrifying prospect' for a small agricultural island like Mauritius. J E Meade 'et al'. The Economic and Social Structure of Mauritius. Op.cit: Ch 2 p.3.

of the population.[1] The post-war demographic situation forced Government to introduce a series of measures in an attempt to stimulate the economy and conjure the nightmare of over-population and unemployment.

The galloping rate of population growth in the nineteen-fifties was accompanied by a relative stagnation of sugar production as the post-war expansion of cane cultivation in the island reached its natural limits. Further increases in output would henceforth require increasingly intensive methods of cultivation, with diminishing returns and rising costs.

Cane acreage covered about 95 per cent of the cultivable land. In these circumstances, any further increase in output would have to be achieved by means of a rise in yield per arpent. This had an important implication regarding the possibility of increased employment in the sugar industry for the rapidly increasing population as the acreage under cultivation is an important determinant of the level of employment in the industry. On the other hand more intensive cultivation is generally associated with capital - rather than labour - biased technology: in land pereparation, weeding, irrigation and harvesting. This would imply that any future increase in output would lead

to an/...

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1. The following benchmark was commonly used in Mauritius to symbolise the condition for a satisfactory rate of economic growth: one ton of cane per head of population. Economists have developed a theory to explain the relation between income and population growth in countries with a low-level of per capita income. This theory is known as the low-level-equilibrium-trap and predicts that below a certain threshold, population growth will act as a check on income growth and keep the economy in a condition of low-level equilibrium. It asserts that population growth in excess of income growth will be self-correcting and vice-versa as long as the country remains below a certain income level. Such a situation of low-level equilibrium may be said to have characterised the Mauritian economy from the 1880s and until the second world war and was profoundly disturbed by the post-war demographic explosion.

to an increase in productivity rather than in the number of people employed in the industry.[1]

The economic problem created in the island by the pressure of population on a stagnant productive base was described by an official publication in the following terms:

> "Viewed against the growing need for employment and income, the situation in Mauritius is one which lacks, within its present economic structure, the dynamism for further economic growth. National income at factor cost would appear to have just about kept pace at current prices with the increase in pupulation over the last fifteen years (i.e. since 1955). This is explained however, not by the real growth of the economy but by the fact that the available income has, largely as a result of government policies, been spread around more ... Commodity production would appear to have increased at current prices by some 16 per cent over the last ten years ... The main increase in national income has occurred in public administration and the service sector, which have increased by two-thirds over the past ten years."[2]

During/....

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1. The ratio of labour to land in the sugar industry of Mauritius is much higher than in many other countries; one daily-paid worker is employed for each 3-4 acres harvested by sugar estates and large planters. In 1966, the sugar industry in Mauritius used seven times as many workers per acre as Australia and twice as many as Guyana and Jamaica. D P Chesworth "Statutory Minimum Wage Fixing in the Sugar Industry of Mauritius". International Labour Review Vol.96 No 5 (September 1967), p.26 footnote 1.

2. Ministry of Economic Planning and Development: Development Strategy 1971-80. Part 1, page 9.

During the nineteen-sixties Government thus tried to offset the effect of overpopulation and the relative stagnation of sugar production, by an expansion of the activities of the public sector; the share of the sugar industry in the GDP (at factor cost) fell from 40.2 per cent in 1953 to 37.6 per cent in 1959 and 31.3 per cent in 1969. While the share of Government services rose from 12.3 per cent to 16.1 per cent and 15.4 per cent respectively. In that way the Gross Domestic Product kept pace with the increase in population during the 1950s and an outlet was found within a fundamentally stationary economy for the pressures which accompanied political emancipation and a runaway demographic situation. Nevertheless an expansion of the public sector on a static production base could only be a temporary paliative both in terms of the GDP per head which began to decline after 1954 and also in terms of employment opportunities.[1]

Employment v. Wages: The Dilemma of Overpopulation[2]

The most comprehensive analysis of the impact of overpopulation on the Mauritian economy is found in the Meade Report and two subsequent articles published by him the Economic Journal.[3] The crucial feature of the Meade model is the assumption that sugar production in the island is subject to an operative supply constraint. The sugar industry might also

be facing/...

1. John King: Mauritius, Malthus and Professor Meade: op.cit.p.4.
2. For a concise and clear exposé of the overpopulation dilemma as seen by Meade in the case of Mauritius, see A Berry and R Sabot: Labour Markets in Developing Countries, Vol.6 No.11/12 November/December 1978.
3. J E Meade et al., The Economic and Social Structure of Mauritius (London: Methuen, 1961; and Cass, 1968). See also J E Meade, 'MAURITIUS: A case study in Malthusian economics', Economic Journal, Vol.71 (Sept 1961); and J E Meade, 'Population explosion, the standard of living and social conflict', op.cit. Economic Journal, Vol.77 (June 1967).

be facing a market constraint and the possibility of a stringent regulation of production by means of quotas. According to Meade the actual ceiling on output would probably be set not by production possibilities but by the problem of finding a market for all the available sugar. Under these conditions heavy population pressure leads to three concomitant evils: a falling standard of living, growing unemployment and inequalies in the distribution of income.

According to Meade, the supply constraint which was holding back output and employment could only be overcome by rapid capital accumulation. At the same time new fields of profitable employment would have to be found for the increased population. In this connection, Meade advocated a policy of low or stable wages which would help to expand employment whenever there was a choice. But in that line of approach he was confronted by an unpleasant dilemma for the development strategy of Mauritius. "In a situation where one class of households owns land and capital resources and another class provides the labour",[1] overpopulation would lead inevitably to a higher concentration of income and further impoverishment of the poorer classes, firstly as a result of the reduction in average consumption standards and secondly as a result of widening disparities in consumption standards. Meade saw in the growing gap between the rich property owners and poor workers the risk of acute social conflict.

Finally/....

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1. J E Meade: Population Explosion, the Standard of Living ... op.cit. p.238.

Finally in his analysis of the problem of overpopulation, Meade postulated the need for a rapid change in the structure of production. There were two reasons for this, one connected with the scarcity of land and the other arising from balance of payments considerations. But institutional factors and the size of the island imposed serious constraints on the development of the domestic sector. Meade was aware of this difficulty,[1] yet he recommended a policy of "forced" diversification out of sugar to restrain too rapid a growth of sugar output and in an attempt to stimulate the creation of alternative employment opportunities.[2]

In a critique of Meade's analysis, King argued that his approach to the problem of overpopulation and economic growth which treated the problem within an essentially close-economy, capital-centred, neo-classical framework and relegated trade problems to a subsidiary role, was inappropriate for the analysis of a small dependent monocrop economy like Mauritius.[3] King proposed an alternative trade-centred approach based on

export/...

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1. In his report, Meade referred to the sharp constrast between the high technical efficiency and good business management found in the sugar industry and the conditions in which the greater part of the rest of Mauritian manufactures have to be conducted. J E Meade 'et al': op.cit. Ch 2, p.25 §2.52.
2. Meade proposed the introduction of a 5 per cent duty on sugar exports.
3. King's argument was inspired by J V Levin: The Export Economies: Their Pattern of Development in Historical Perspective (Cambridge, Harvard University Press 1960) and D Seers: The stages of Economic Development of a Primary Producer in the twentieth century. Economic Bulletin of Ghana Vol. VII No.4 (1963) which both emphasised the importance of foreign trade in the economic development of export economies. In a ~~contemporary~~ study of the Jamaican economy D J Harris* has shown that the trade-gap - i.e. the excess of imports over exports - was the main obstacle in the way of the achievement of a higher rate of growth by the Jamaican economy. With regard to the importance of foreign trade considerations in the formulation of Government labour policy, see below, Ch 4 pp.271/

* D J Harris: Social and Economic Studies, University of West Indies, Jamaica, Vol. 19 No.2 June 1970.

export diversification and import substitution. He advocated a change in income distribution in order to stimulate the demand for domestically produced goods. But in so doing he may have fallen into the same trap as Meade. If the pattern of income distribution is not a determinant factor, in the process of economic growth, but is itself determined by it and if, besides, expenditure patterns are not determined by income alone but also to a large extent by imported tastes and habits, King is heading for a dead-end in his attempt to activitate economic growth through a stimulation of domestic demand by means of an arbitrary income redistribution.

To recapitulate, while the economic structure of Mauritius was being transformed under the pressure of economic forces emanating from overpopulation, radical changes were also taking place in the political and constitutional sphere. These changes, culminating in independence, brought to power a new administration which derived the bulk of its support from the urban and rural proletariat and embarked on a programme of social reform in an attempt to improve the condition of their mandates and reduce the inequalities in the pattern of income distribution in the island.

III/...

The Underdevelopment of Industrial Relations

In previous sections we studied the organisation of labour on the early plantations, a system characterised by industrial feudalism and coercive employment conditions. These conditions had a lasting influence on the development of the agricultural labour force in the island. In the last section we analysed the process of change which transformed the island's plantation society after the war. This section will cover the underdevelopment of industrial relations in Mauritius, which was the avowed motive behind Government's decision to set up Wages Councils in the sugar industry.

In accordance with the provisions of the law (the Regulation of Wages and Conditions of Employment Ordinance No.71 of 1961), the Minister of Labour, being of the opinion that no adequate machinery existed for the effective regulation of the remuneration and other conditions of employment of workers in the sugar industry, published notices of his intention to set up Wages Councils, one for the agricultural workers and another one for the non-agricultural workers, in the sugar industry.[1]

The Minister's decision may have been prompted by other considerations than those that were put forward officially. It has been argued that the speed with which the Sugar Industry Wages Councils completed their task and Government implemented their recommendations can be explained by Government's desire to ensure for the workers a greater share of the proceeds of an

exceptional/...

1. Annual Report of the Labour Department 1963, Part I, page 15.

exceptional year. Elections were also scheduled for 1963 and the setting up of the Wages Councils could have formed part of the Government electoral strategy.[1] On the other hand it may be argued that since 1961, Government had made provision for the establishment of Wages Councils as a result possibly of the recommendations made in the Luce and Meade reports,[2] and the Minister of Labour had, in 1962, given notice in the Legislative Council of his intention to introduce Wages Councils in the sugar industry in the course of the year.

The reason he gave was Government's desire to legislate with regard to conditions of employment, wages, holidays and other things in a better way than could be done under the existing legislation. It would appear therefore that the establishment of Wages Councils in the sugar industry formed an integral part of the Government labour policy even though the actual timing of these measures may have been dictated to some extent by considerations of political expediency.

Industrial Relations in the Developing Countries

Turner defines a developing country as one in which the growth of the industrial or modern sector is inadequate to absorb the population surplus in the traditional sector.[3] He mentions three important aspects of economic underdevelopment from the point of view of employment and income policy. These are:

(i)/...

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1. P Hein: op.cit. Ch 3, pp.128, 129.
2. See above Introduction page 7.
3. H A Turner: Wage Trend, Wage Policies and Collective Bargaining. The Problem of Under-developed Countries. Cambridge (1965).

(i) specialisation in one or two export crops, (ii) a situation of economic dependence and (iii) the importance of Government. In those countries the domestic economy is subject to wide fluctuations and uncertainties transmitted by the export sector. This concept of economic underdevelopment lays stress on the limitations that exist for the pursuit by government of a national wage policy. In such an economy, the level of economic activity is not determined locally and thus liable to government control by means of fiscal and monetary measures but depends on export proceeds which are determined by forces outside the control of producers or government and are traditionally subject to wide fluctuations.[1]

In circumstances where production is strongly responsive to climatic hazards and prices are determined by the world economy, it becomes very difficult, if not impossible, for government to formulate and implement an effective wage policy; where the capacity to initiate wage increases depends to a large extent on fluctuating export proceeds, while an increase in wages is likely to lead to a rapid and substantial increase in imports.[2] Besides in most developing countries government is at the same time one of the largest entrepreneurs (a large proportion of all investment, particularly of the infrastructural type is public investment) and one of the largest employers. In these countries government often pays as much as thirty per cent, and sometimes as much as fifty per cent of the national wage bill. In these conditions, "the most immediate and painful effects of a higher minimum wage are felt in the public treasury."[3]

But/...

1. J B Knight: The Determination of Wages and Salaries in Uganda. Bulletin Oxford Univ. Institute of Economics and Statistics, p.234.
2. ILO: op.cit.
3. Idem

But these considerations relate to the macro-economic aspects of labour policy in developing countries to which we shall return later. At this stage we are more concerned with a particular aspect of economic development which relates to the nature of the relations between employers and workers.

Developing countries have certain inherent characteristics which prevent or retard the development of industrial relations and collective bargaining. Many of them are facing a chronic labour surplus as a result of the very rapid rate of population increase which has taken place in these countries after the war. Further, labour markets in many developing countries are characterised by the weakness of trade unions "with few organisers, fragmented, divided by political, religious and other considerations"[1] and the inefficiency or absence of collective bargaining. To a very substantial extent collective agreements in developing countries are the creation of public services or individual firms and governments, rather than the effect of employee pressure."[2]

In circumstances where trade unions are either inexistent or ineffective and divided, it is difficult to envisage the development of industrial relations or collective bargaining. For collective bargaining can be seen primarily as a method of redressing the balance between the individual worker and employer. It will reflect in its results the respective economic positions, organising ability and bargaining skills of the parties and their capacity to make collective agreements,

in other/....

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1. H A Turner: op.cit.
2. Idem

in other words, their respective bargaining strengths. This pre-supposes the existence of a mature industrial society and an organised labor force. "The working class must be both stabilised in the sense that it is composed of people permanently and exclusively dependent on wage labour for their livelihood and structured into definite occupational or vocational groups. Collective bargaining is impossible for a labour force like that of some underdeveloped economies which is predominantly casual and undifferentiated because the only classification such a labour force permits - for wage fixing for instance - is by individual qualities."[1]

The underdevelopment of industrial relations in developing countries may also be explained by the "great social distances" and lack of social mobility which characterise pre-industrial societies. We have described the plantation society as a feudal type of organisation, which gave rise to a rigid caste-like system of social stratification based on race and colour lines. In that hierarchical society the labouring class tended to remain in a state of "undifferentiated atomisation at the bottom of the social structure."[2]

The problem of communication in this case stems from the rigid pattern of social divisions which make face-to-face relations of authority hard to bear. Employers are often reluctant to deal directly with labour unions; on the other hand they are typically much more amenable to government intervention than their counterpart in the more advanced societies.[3] Hence the

relations/...

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1. H A Turner: op.cit.
2. G L Beckford: op.cit. Ch 3.
3. A M Ross, Industrial Relations and Economic Development. International Institute of Labour Studies (Geneva).

relations between employers and workers tend to become formalised in a set of rules and regulations. It is only with greater social mobility that these aspects of underdevelopment can be eliminated.[1]

Besides, in agricultural activities, like the cane sugar industry, success depends to a very large extent on weather hazards (cyclones and droughts), and the world market price. In these enterprises the quality and motivation of personnel takes second place; whereas the large business organisations of the modern world rely to an ever increasing extent on their technological and commercial capabilities, which are directly related to the quality of manpower.[2] The nature of the work on sugar estates is particularly suitable for task work and a casual labour force requiring only limited supervision. It consists of a number of simple routine operations and the labour force is dispersed in the fields; besides weather conditions have an important bearing on the timing of field operations. There is thus need for much flexibility in the organisation of field work and the composition of work teams. In these conditions employers are inclined to make use of a casual labour force employed by the day and paid by the task.[3] Briefly, collective bargaining requires a number of pre-conditions -

social/...

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1. P Hein: Op.cit. Introduction p.6.
2. Idem. Ch 1 p.31.
3. (i) A statement on Decasualisation and Reclassification - Mauritius Chamber of Agriculture Annual Report 1958/59.
   (ii) P Hein refers to a study made by the University of Liverpool, Department of Social Science, relatively to conditions of work of casual labour in the docks. It was found that for that class of labour, it was impossible or at least difficult to set-up disciplined work groups under a stable and permanent authority and to introduce modern techniques of selection and training of personnel. It was equally difficult to develop effective two-way channels of communication between the employers and workers (P Hein: Op.cit. Ch 2, p.76).

social, industrial and institutional - to be effective which even in advanced countries have not always obtained and which are far less likely to be found in pre-industrial societies.[1]

The Estate Labour Force: Unskilled, Traditional and Unorganised

We shall now consider the characteristics of labour organisations in Mauritius, which, in the light of what has been said above, can account for the underdevelopment of industrial relations in the island. In the first place as mentioned before,[2] the pattern and nature of emigration to Mauritius gave rise to a class-caste system in which the distribution of occupations closely followed the ethnical composition of the labour force. Table 9 below, which is compiled from the 1952 Population Census data, gives the occupational distribution of the various ethnic groups in the island.[3]

TABLE 9/....

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1. H A Turner: op.cit.
2. See above , Chapter 2 page 65.
3. Burton Benedict: Problems of a Plural Society, Ch 3, p.27.

TABLE 9 : Percentage of Individuals, in each of the Census Category Ethnic Groups, Engaged in a Selected Number of High Employment Occupations

Occupation	Indo-Mauritian %	General Population %	Chinese %
1. Gardeners	94.6	5.4	-
2. Farmers or Plantation Managers	93.8	6.2	-
3. Cart drivers or Cartmen	93.6	6.4	-
4. Costermongers and Hawkers	93.6	3.0	3.4
5. Agricultural Labourers	90.4	9.5	0.1
6. Messengers and Office Orderlies	85.7	14.3	-
7. Unskilled Labour in Building and Industry	84.7	14.9	0.4
8. Car and Taxi-Drivers	76.6	22.2	1.2
9. Tailors (male)	71.4	27.3	1.3
10. Domestics (male)	71.2	28.0	0.8
11. Proprietors of Mixed Retail Business	36.6	2.6	60.8
12. Clerks (unspecified)	33.9	60.9	5.2
13. Dock Workers	31.3	68.4	0.3
14. Teachers	28.8	68.3	2.9
15. Carpenters	24.4	75.2	0.4
16. Motor Mechanics	24.3	73.9	1.8
17. Domestics (female)	23.9	75.9	0.2
18. Fishermen	22.2	77.8	-
19. Machinery Maintenance Fitters	18.6	80.8	0.6
20. Stone Masons	18.1	81.1	0.8
21. Needlewomen	16.7	80.9	2.4
22. Shop Assistants in Mixed Retail Business	13.6	4.7	81.7
Percentage of each ethnic group in the total population	66.9	29.6	3.5

SOURCE: 1952 Population Census. Part II Table XXII pp.9-19. The 1962 and 1972 Censuses do not list occupations by ethnic category.

In 1952/...

In 1952, 67 per cent of the labour force employed in "large employment occupations" consisted of Indo-Mauritians. The term denotes both Hindus and Muslims. Hindus represented approximately 76 per cent and Muslims 24 per cent of the Indo-Mauritian population.[1] Muslims are predominantly town dwellers; 56 per cent of them lived in the urban districts of Port Louis and Plaines Wilhems while two-thirds of the Hindus lived in the rural districts where they constituted the bulk of the population. The Indo-Mauritian agricultural labour force was predominantly Hindu while a relatively large proportion of Indo-Mauritians in urban occupations were Muslims. Clerks, dock workers, teachers, carpenters, mechanics, stone masons, needlewomen and domestic servants belonged in their majority to the General Population. The Chinese worked as retailers or shop attendants.

As the figures show there was a strong ethnic element in the distribution of occupations in the island. Thus the labour market in Mauritius conformed to the picture given by Turner and others and ethnic divisions would appear to have played a significant role in the development of industrial relations in the Island. These same forces would tend to militate against the emergence of strong trade unions and a homogeneous labour force in the Island.[2]

The job/...

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1. These percentages are based on the 1962 Census figures, as the 1952 Census did not differentiate between Hindus and Muslims.
2. P Hein: op.cit. Ch 2 pp.77 and 79.

The Job-Contractor

Another factor had a fundamental influence on the development of industrial relations in the Island. That was the predominant role played by the sugar industry in the labour market. In 1969-72, 60 per cent of the daily-paid labour force in large establishments was employed in the sugar industry and 70 per cent of the wage earners in private - i.e. non-government - employment.[1] Owing to the high percentage of wage earners working in the sugar industry, labour conditions in the Island would tend to reflect to a large extent the nature and conditions of employment inside the industry.[2]

We should mention here an important feature of labour recruitment in the Mauritius sugar industry: the system of job contracting. "The job contractor not only contracts to do a particular job such as clearing-up of a section of a sugar plantation or cutting a certain weight of cane, but recruits the labourers, brings them to the site and in the majority of cases pays them for their work."[3] He was in a sense the real employer of labour and the relations between him and the labourers were much closer and more personal than those found generally between employers and workers. These relations were based on kinship ties and allegiances and the cash and credit network of the rural economy.[4] In lean times the job contractor lent money to labourers, who thus became financially committed to him. The

extensive/...

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1. Bi-annual Survey of Employment and Earnings in Large Establishments - Central Statistical Office.
2. See below Chapter 3, pages 128-133.
3. R W Luce: Op.cit. Ch 6, p.27.
4. B Benedict: Cash and Credit in Mauritius, (196) typescript.

extensive use by estates of job contractors for the recruitment of their field labour force can be seen as a symptom of the "social distances" which impede communications between employers and workers in the industry. This arrangement minimised the direct responsibility of the employers for much of their work force, though there remained a residual responsibility for the payment of wages in the event of default by the job contractor.[1]

In the period between 1950 and 1958 there was an increase in the number of caual labourers on estates and in the number of people recruited and paid by job contractors.[2] The reason for this was that from the estate point of view contract labour was cheaper than monthly paid regular labour, for the worker had little bargaining power when recruited through the job contractor, who was often a sirdar on the estate and sometimes the local representative of the trade union as well.[3]

Meade attributed the high rate of absenteeism and the difficulties experienced by estates in the recruitment of field labour, at least partly to this unsatisfactory system of recruitment and payment and the almost complete absence of direct communication between the estates and the men. He described the estate field labour force as "a large mass of drifting semi-casual ... labourers," and saw "a vicious circle" between the unattractiveness of field work on estates, absenteeism and the intensive recruiting activities deployed by estates. To break this vicious circle labour on estates should, in his opinion, be employed and paid directly by the estate.

It can be/...

1. D P Chesworth. Statutory Minimum Wage Fixing in the Sugar Industry of Mauritius in International Labour Review - Vol.96 No.3 (September 1967), p.10.
2. J E Meade 'et al': Op.cit. Ch 4, p.63
3. P Hein: Op.cit. Ch 2, p.85.

It can be argued that the part played by the job contractor as the king-pin in the system of recruitment of estate labour underlines the importance of non-economic factors in the sugar industry labour market - the strength of kinship ties and group allegiances in the rural society to which the labourer belongs. Hence the need for recruiting agents, between the estates and the labourers. The presence of a large army of job contractors can thus be seen as a symptom of the structural rigidities that are present in the island labour market, which reflect "the rigid pattern of social divisions" and great social distances which characterise the local society. The ultimate remedy would appear to lie in a fundamental reform of the labour system, and of the plantation system of which it forms part, in the course of the modernisation of the island society.

As regards the economic aspects of industrial relations, we must underline the large share of wages in the total cost of sugar production (about fifty per cent).[1] This implies that the sugar estates are highly sensitive to an increase in labour costs. As we have seen before, the price of sugar depends on the world market and is subject to sharp fluctuations.[2] Traditionally the wage policy of estates tended to reflect the risks entailed by the dependency of the sugar industry on an

unstable/...

1. P Hein, Op.cit: Ch 2, p.64.
2. In the fifties and sixties, the sale of Mauritius Sugar was governed by the terms of Commonwealth Sugar Agreement (CSA), under which Mauritius had a guaranteed quota of about 335.000 tons, which was sold at a negotiated price - the price being fixed at annual meetings between the Commonwealth sugar exporters and the British government. Under the Agreement, an additional quantity of about 140,000 tons was sold in UK and Canada at a preferential price (i.e. at world price plus an element of preference); the difference being sold on the world market.

unstable world market. Besides, in a small dependent economy like that of Mauritius, problems of rising wages, diminishing profitability and falling returns on investment will have important repercussions on the distribution of income, government revenue and the Balance of Payments.[1] Thus the social objectives of labour policy are closely circumscribed by economic considerations which impose narrow limits to Government action in labour matters. To these problems we shall return in the next two chapters.

Weak and Unstable Trade Unions

Besides the heterogeneous nature of the island society, the absence of communication and the dependence on the world market, two other factors may also account for the underdevelopment of industrial relations in the Island. These are the low degree of unionisation of the labour force and the growing rate of unemployment and underemployment.

Trade unionism in Mauritius is characterised by a large number of unions and their limited representativeness.[2] In 1960 there were 72 unions in the Island, of which only 6 had a membership exceeding one thousand. According to Hein, there was a good deal of overlap and rivalry between them and much confusion, with several unions claiming to represent the workers in the same industry. The divisions found in the Trade Union movement often reflected the ethnic and cultural divisions that exist

in the/....

1. See below Chapter 4, pages 271 - 275.
2. For an account of Trade Unions in Mauritius, see Hein, op.cit. Chapter 1, pp.33-45.

in the island. Thus it would have been difficult for, say, the dockers union, with a creole membership to join the same federation as the agricultural labourers union (which was almost exclusively Hindu.)[1] Hein also attributed the weakness of the Trade Union movement to the fact that many of its leaders were prominent politicians mostly in the ranks of the Labour Party and became government ministers after the advent of the party to power. That deprived trade unions of many of their most able men.

Other sources confirm the picture of weak divided trade unions given by Hein. In his report, Balogh[2] mentioned the extreme confusion that prevailed in the labour market and the surprisingly high number of trade unions. He added that unions were not, in the existing conditions of the labour market, a vital controlling force in the economy. In the Legislative Council Debates on the Regulation of Wages and Conditions of Employment Ordinance 1961, the Minister of Labour stressed the inadequate representativeness of trade unions in the sugar industry "where the more important organisation could claim to represent roughly about 12,000 and another organisation claimed to represent about four thousand or five thousand whereas there were sixty thousand workers in the industry."[3]

An Excess/...

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1. This may no longer be true as the General Workers Federation now includes among its members the Port Louis Harbour Workers Union and the Sugar Industry Labourers Union.
2. Commission of Inquiry (Sugar Industry) 1962 T Balogh and C J M Bennett, Ch 9, p.117 §9.25.
3. Legislative Council Debates. Regulations of Wages and Conditions of Employment Ordinance (1961) 4260/4261.

An Excess Supply of Labour

The last factor in our analysis of industrial relations in Mauritius is the high rate of unemployment and underemployment among the labour force. The excess supply of labour in the Island has resulted in increasing overt or disguised unemployment. However, without a precise definition of unemployment, it is difficult to make an accurate estimate of the actual number of unemployed labour in the Island. "With so much part-time and barely remunerative employment, any estimate of the degree of unemployment and underemployment of the economically active population would hardly be meaningful. That there is a great deal of unemployment and sub-marginal employment is a matter of observation."[1] Nor do the figures of registered unemployed provide a reliable indication of the extent of unemployment. The degree of imprecision in this matter can be gauged by the different estimates found in official reports and statements.[2] What is certain, however is that with the rapid rate of increase in the labour force and the small increase in the number of jobs available in large establishments, there must have been a substantial increase in the number of people working in the informal sector or unemployed. The informal sector comprises people working in small establishments or on their own account. It includes a large number of

marginal/...

1. Ministry of Economic Planning and Development: Development Strategy 1971-80 §1 p.11.

2. Luce in 1958 estimated that there were 31,000 people unemployed, (15.1%) of a total labour force of 205,300. According to the Mauritius Family Budget Inquiry of 1962, referred to in the Balogh report, there were 183,500 people in the labour force and unemployment amounted to 11,300 (6½%), during harvest and 15,000 (9½%), between the crops. In 1966 the Director of the Economic Planning Unit put the rate of unemployment at 20% of the labour force.

marginal and part-time occupations.[1] In Mauritius the average productivity of people in the informal sector is reported to be much lower than that of people working in the organised part of the economy (large establishments.)[2] Table 10 shows the number and rate of growth of the working age population, the estimated labour force, employment in large establishments and the unemployed labour force in 1952, 1962 and 1965 to 1969. It also shows the estimated number of people working in the informal sector (including people partially or completely unemployed).

TABLE 10/...

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1. The informal sector is defined in a variety of ways, but, in empirical exercises, it is usually limited to own account workers and establishments employing less than a stipulated number of persons. The actual number varies in different countries.

   In certain countries establishments employing five or more workers are considered as forming part of the formal sector; in Mauritius firms employing ten or more workers are classified as large establishments. The presumption is that minimum wage legislation and other institutional factors have little influence on labour earnings in the informal sector and that therefore labour incomes will be uniformly low because of the pressure of excess labour supplies.(a)

   (a) L Squire: Labour Force, Employment and Labour Markets in the Course of Economic Development. World Bank Staff Working Paper No.336. Mimeo June 1979. Op.cit. Pt III Ch 9,p.88.

2. Table 11 below, which is compiled from the Census of Industrial Production 1964, shows the differences in the average labour productivity in large and small establishments.

TABLE 10 : Population, Labour Force, Employment and Unemployment (1952 - 1969)

(000)	1952	1962	1965		1966		1967		1968		1969		Average rate of growth[1]
1 Population (15-64)	283	351	362		375		386		398		410		3.4
2 Labour force	132	187	218[2]		225[2]		232[2]		237[2]		245[2]		3.7
3 Employment Large Establishments	...	...	...	...	104		106		111		112		1.2
4 Unemployed labour force		11	-	-	40[3]		46[3]				50[3]		
5 Registered unemployed		3.6	8.1	8.2[4]	13.9	12.3[4]	16.6	8.7[4]	10	8.1[4]	14.8	13.3[4]	-
6 People in the informal sector and unemployed (2-3)	...	...	...	...	121		126		126		133		

SOURCE: R Lamusse: The Strategy to relieve Unemployment. University of Mauritius. Mimeo
P Hein: Les relations industrielles à l'Ile Maurice, op.cit. Ch2, p.56, Table 8.

1. Based on terminal year figures
2. Estimated labour force. These estimates are based on the working-age population and the participation rates for each age group.
3. Estimated. (The Economic Planning Unit in 1969 estimated that unemployment was increasing at the rate of 4.000 per annum).
4. March and September figures. The increase in the number of registered unemployed followed the introduction of relief work.

Our aim, however, is not to obtain a more or less accurate measure of unemployment in the Island. We know, and it is a well documented fact, that there is an important surplus of labour in Mauritius. The important point to consider is the effect of this situation on the development of labour relations in the Island.

In such a situation we would expect the wage rate of unskilled labour to be unresponsive to changes in demand and wages to remain depressed as long as the situation persists. The presence in Mauritius of an excess supply of labour is confirmed by the relative stability of wages in the Island, between 1939 and 1957 in a period when sugar production virtually doubled. Besides national income figures in the nineteen-fifties show that the compensation of employees did not fluctuate with variations in export earnings; the greater part of the variations was absorbed by changes in the profits of companies and to a smaller extent in the income of unincorporated enterprises,[1] precisely what we would expect from a situation of surplus labour. Given the growing gap between the number of people looking for work and number of jobs available in the organised sector, the labour market cannot play its proper regulatory role in the economy. Nor can it be expected that a modification of the balance between the employers and workers, as could be achieved through a better organisation of labour, would bring about a substantial improvement in the workers' remuneration. It requires direct measures by Government to increase the workers' earnings in this situation. Luce, Balogh and Meade have all envisaged and recommended, explicitly or implicitly, a more

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1. J E Meade 'et al'. The Economic and Social Structure of Mauritius, op.cit. Ch 3 § 3.15.

TABLE 11

The following data, taken from the 1964 Census of Industrial Production, show the differences in labour productivity in large and small establishments.

		No of establishments 1	Net Output (Rs 000) 2	No of persons engaged 3	Productivity (Rs 000) (2/3)
1 Food	L.E.	48	4,215	904	4,663
	S.E.	110	1,826	714	2,557
	Total	158	6,041	1,618	3,734
2 Beverage Industries	L.E.	15	13,414	1,178	11,387
	S.E.	16	163	91	1,791
	Total	31	13,577	1,269	10,125
3 Wood, Cork, furniture and fixtures	L.E.	13	1,187	266	4,462
	S.E.	121	1,489	804	1,852
	Total	134	2,676	1,070	2,501
4 Textiles, footwear, wearing apparel	L.E.	19	1,233	723	1,705
	S.E.	200	1,121	994	1,128
	Total	219	2,354	1,717	1,371
5 Leather (except footwear) rubber & chemical products	L.E.	9	1,950	350	5,571
	S.E.	14	439	91	4,824
	Total	23	2,389	441	5,417
6 Non metallic mineral products	L.E.	22	5,731	637	8,055
	S.E.	23	241	134	1,799
	Total	45	5,372	771	6,968
7 Metal products & machinery except electrical	L.E.	14	3,834	838	4,575
	S.E.	13	114	64	1,781
	Total	27	3,948	902	4,377
8 Electrical machinery	L.E.	4	689	119	5,790
	S.E.	6	30	27	1,111
	Total	10	719	146	4,925

SOURCE: Census of Industrial Production 1964, Central Statistical Office, September 1965.

direct Government involvement in labour matters, in order to solve the dilemma posed by overpopulation and to improve the conditions of workers in the Island.

Conclusion

The labour system in Mauritius has many features which are common to other developing countries. With a fragile dependent-economy dominated by an unstable export crop, Mauritius has a segmented labour market and an heterogeneous labour force, reflecting the rigid pattern of social divisions found in the Island; trade unions are weak and divided and in the presence of a growing surplus of labour in the organised sector would appear to have had little effective control over wages. Besides historical factors had a strong influence on the development of the Island labour force and have left their mark on the nature of group behaviour and the system of industrial relations.

In these conditions, collective bargaining may not be able to play its role as an effective "countervailing force" against the oligopsonistic behaviour of employers. These shortcomings have led observers to advocate more direct measures to promote the interests of workers, foster the development of trade unions and lay the foundations for an effective system of industrial democracy. For wage policy is an important instrument of social and economic progress. In the absence of a well-developed system of industrial relations and effective collective bargaining, it is incumbent on Government to take the lead and fix the level of wages in conformity with the national objectives and priorities.

Thus/...

"Unfortunately public authorities in developing countries have proven singularly susceptible to the pressure of organised groups (...) and government labour policy may sometimes have been inspired by motives of political expendiency and decisions have been made on wage matters, without an adequate analysis of the implications for the economy as a whole."[1] It is to these issues that we shall turn in the following chapters. In the next chapter we shall analyse the influence of Government labour policy on the evolution of the wage structure in the Island and in Chapter 4, the effect of wage increases on the structure of production and costs, Government finances and the Balance of Payments.

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1. ILO Geneva: Minimum Wage Fixing and Economic Development 1968.

CHAPTER 3

THE WAGE STRUCTURE AND GOVERNMENT LABOUR POLICY

"Wages are not determined by supply and demand .... but by an interplay between social and economic factors ..."[1]

J R HICKS

Introduction

Labour markets play a fundamental role in the economic system: changes in economic conditions are converted in these markets into changes in wages which lead to a reallocation of labour and a redistribution of income in the economy. These markets operate in an environment shaped by social and political forces, which interfere in many ways with their operation. Labour policy can thus be seen as the outcome of social, political and economic forces interacting on one another.

The labour market plays a triple role in the economy. In the first place it helps the adjustment of the economy to changing market conditions. Secondly wage policy is one of the most important instruments of social policy. Thirdly labour policy is a fundamental instrument of demand management. Labour policy is thus a vital instrument of social and economic management. This outline of the role of the labour market in the economy will provide the broad background for the investigation and analysis of Government labour policy in Mauritius.

In this/....

1. J R Hicks: The Economic Foundations of Wage Policy. Economic Journal 1965 No.259 referred to in J Burton and J Addison: The Institutionalist Analysis of Wage Inflation, A Critical Appraisal, P.334.

In this chapter, we shall concentrate on the micro-economic aspect of labour policy. The macro-economic aspect will be considered in the next chapter.

In his study of the Mauritian economy, Meade laid stress on the importance of the sugar industry in the Island labour market in these terms: "The sugar industry is of such central importance that the wage rates paid in that industry are likely to set the level that will be acceptable in other industries."[1] A similar view was expressed by Hein, when he wrote "that the sugar industry is so important and omnipresent in the Island that the conditions that are established and practices followed in that industry will have a strong influence on the rest of the private sector."[2] It will be our aim in this chapter to verify these assertions, to assess the importance of linkages between the sugar industry and other sectors of employment in that respect, and to investigate the importance of institutional factors[3] in the Island labour market.

In order to determine the role played by the sugar industry as a wage leader we must first of all analyse the structure and organisation of the labour market. The degree of interdependence between the different sectors, will determine the extent to which a wage settlement in a particular industry will "spill over" to other industries and the extent to which an increase in a particular sector will tend to be imitated elsewhere.

Our investigation/...

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1. J&Meade 'et al', op.cit. Ch 2, p.13 §2.28.
2. P Hein: op.cit. Ch2 p. 63 (Translated from French).
3. For a definition of the term, see above: Introduction p.16, footnote 1.

Our investigation of the local labour market will be based on a study of the movement of wages and earnings in the Island after 1966. Our objective will be to look for evidence of a definite pattern in the evolution of wages and sectoral earnings; this would imply an underlying structure that holds together wages and salaries in different industries. In a situation where each sector is completely isolated we would expect wide differences in the rates paid and in the movement of wages in the different sectors. On the other hand where a powerful wage transfer mechanism exists there will be a tendency for earnings in different industries to keep in step with each other; in the extreme case the transfer mechanism will be so powerful as to ensure complete uniformity in the rate of change of earnings and the structure of earnings will remain unaltered over time. In the less extreme cases there will be varying degrees of uniformity or dispersion in the rate of change of sectoral earnings and this will lead to changes in the structure of earnings over time.[1] In an organised labour market with strong intersectoral linkages and interdependency between industries with regard to wages there will be cohesion in the structure of earnings and their movement over time whereas in a segmented market the transmission mechanism will be weak or inoperative. In that case a given increase in a particular sector will have a very limited impact on the rest of the economy.

The point/...

1. C Mulvey & J A Trevithick: Some evidence on the wage leadership hypothesis. Scottish Journal of Political Economy Vol XXI No.1. February 1974, p.2.

* A Horsman: The Relation between Wage Increases and Employment in an Open Economy. M Parkin and G Zis (ed): Inflation in Open Economies, Ch 7 p.178.

The point is that wage increases do not occur in a vacuum but as part of an established structure and a widening of existing differentials between sectors will give rise to pressures for adjustment.[1] A knowledge of the extent of contagion, of the importance of the spill-over effect of wage increases, will clearly be important to Government in the formulation of wage policy. Besides, where the linkage effect dominates the process of wage determination, the allocative role of wages in the economy will be substantially reduced; the responsiveness of wages to changing market conditions may be considerably reduced in a labour market in which contagion dominates wage determination.[2] Nor does Government intervention reduce the effect of institutional forces in the process of wage determination. On the contrary, Government intervention in labour markets, will tend to reinforce their influence relatively to that of market forces in the process of wage determination.[3]

Our purpose is to study the island wage structure and analyse the effect of minimum wage legislation in the sugar industry on the evolution of wages and earnings in the Island. The available data preclude a rigorous analysis of the process of wage determination in the Island nor would a strongly deterministic model - as developed for the analysis of wage determination in organised labour markets - be justified "a priori" in the conditions of Mauritius and other developing countries.[4]

Quantitative/...

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1. In a study of wages and inflation, A.Horsman uses the variance of the wage distribution, σ^2, as a measure of the degree of imperfection in labour markets.*
2. Robert J Flanagan: Wage Interdependence in unionised labor markets ... Brookings Papers on Economic Activities, p.637.
3. The importance of the labour lobby in developing countries has been mentioned by Reynolds and Gregory (1965), B J Knight (1972), Turner (1965), Berg and Ross (1966) and others.
4. See below pages 127/128.

Quantitative analysis of the relation between wage and earnings in different sectors are not easy to interpret and for most developing countries available data do not permit any rigorous study of the nature of inter-sectoral wage dependency. Our purpose will be rather to study the movement of wages and earnings in order to obtain an idea of the influence of institutional forces on the determination of wages in the island and thus throw some light on the organisation and operation of the Island labour market. The data assembled and preliminary investigation made in this chapter may hopefully lead to further research into the social, economic and institutional factors which underlie the determination of wages in the Island.

Wage Leadership: The Theoretical Background

The conventional theory of wage determination analyses the behaviour of employers and employees when the demand for and supply of labour can be determined without ambiguity. It is based on an imaginary world in which markets are assumed to adjust smoothly and instantaneously to the changes which may occur in the conditions of demand and supply. But it would appear that relatively little work has been done so far to analyse the behaviour of labour markets out of equilibrium or to define a satisfactory model of market behaviour in the face of imperfect information. According to Rothschild,[1] it is a formidable task to design decision rules appropriate for dynamic, uncertain and imperfectly competitive situations and to show that in these situations the market converges to equilibrium. Most of the

models/...

1. M Rothschild. Models of Market Organisation with Imperfect Information: A survey, in Journal of Political Economy, Vol. 81, No.6, November/December 1973, p.1285.

models formulated so far are based on strong assumptions which "describe the behaviour of no market participants."[1] These inadequacies undermine the validity of the propositions which follow from these models and lead to an embarrassing diversity of solutions from which it is hard to draw any firm conclusion.

The presence of imperfect information and uncertainty thus presents a fundamental challenge to the established creed and precepts of economic theory and competitive equilibrium may no longer be the "optimum optimorum" in a world of volatile prices and imperfect information. It should be the aim of research to determine the sorts of institutional arrangements that would appear to operate most effectively in the face of imperfect and asymmetric information. It is in the awareness of the shortcomings of conventional economic theory, when applied to the analysis of the process of wage determination, that the institutionalist theories of wage determination may find their justification.

According to institutionalist analysis of wage determination, the labour market is an interlocking system in which anything that happens in one sector will affect many other sectors. A hallmark of the institutionalist position has been the rejection of abstract general theories and the advocation of an indicative approach to research. They believe that nominal wage changes are (primarily) transmitted from one sector of the labour market to another not by a market mechanism, but by a spillover mechanism. "Members of the institutionalist school argue that,

although/....

1. M Rothschild: Models of market Organisation with Imperfect Information: A survey, in Journal of Political Economy Vol. 81, No.6, November/December 1973, p.1299.

although market forces have some impact on wage determination, "these forces work so slowly , and are shut out over such wide ranges of play by the cost of change and effect of uncertainty, that there is a very considerable scope for decision makers ... to administer wages according to extra-market criteria, at least within a considerable range that is only ultimately constrained by the orthodox pressures of the market."[1] For economic behaviour which may appear irrational in a classical world of maximising behaviour and perfect information may become quite rational in the real world conditions characterised by market uncertainty.

A weakness of institutionalist position, however, is that insufficient attention has been given to the task of "reorganising and systematizing the emergent body of empirical research results."[2] The institutionalists generally appear to be more concerned with the process of wage adjustment, and the analysis of the wage-transmission mechanism, between different sectors. The outcome is a confusingly large number of "ad hoc" hypotheses based on empirical studies of specific labour market situations. But no number of these hypotheses can ever amount to a valid general theory of wages and as a result "institutionalism has failed to dislodge neo-classical economics as the dominant scientific paradigm in the study of wage determination."[3]

In our view, the institutionalist analysis of labour markets may be seen not as a rejection of neo-classical theory but as an extension of that theory to the process of wage determination in the context of unionised labour markets. We would

agree/...

1. J Burton & J Addison: The Institutionalist Analysis of Wage Inflation; a critical approach. p.338
2. Idem, p.335
3. Idem, p.334.

agree in this regard with R J Flanagan that studies of aggregate changes in earnings particularly those that are mute on the role of unions, obscure important differences in the process of wage adjustment under different market structures.[1]

We shall now proceed to a brief survey of the institutionalist theory of wage determination.[2] According to the institutionalist school wage changes are transmitted throughout the economy by means of a transmission mechanism of the general form:

$$\dot{W}^i_t = \sum_{z=0}^{h} \sum_{r=1}^{n} s^{ir}_{t-z}\, \dot{W}^r_{t-z} \qquad s^{ir}_{t-z} \neq 0$$

for all $i = 1 \ldots n (i \neq r$, for $z = 0)$,

Where $\dot{W}^i$ = the proportional rate of money wage increase in sector i;

$\dot{W}^r$ = the proportional rate of change of money wage increase in the reference sector r;

s^{ir}_{t-z} = a coefficient expressing the magnitude of the spill-over effect of the rate of rth sector wage change in period t-z on the current rate of ith sector wage change.[3]

This general form of the transmission process of money wage changes can be represented by a simultaneous system of difference equations. It can alternatively be expressed in matrix

notation/...

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1. R J Flanagan: Wage Interdependence in Unionised Labour Markets, op.cit. p.638.
2. The material for this section is drawn from the study by J Burton and J Addison: The Institutionalist Analysis of Wage Inflation; a critical approach.
3. J Burton and J Addison: op.cit. p.335

notation where the array of spillover coefficients would comprise the "wage pattern matrix" of the spillover system as Tobin called it.[1] This represents a strongly deterministic view of the wage transmission mechanism in which wages in other sectors follow rigidly changes in the key sector or sectors.

This general form of the transmission process has been called the generalised-spillover hypothesis (GSH). The wage-leadership hypothesis (WLH) provides a more restrictive version of the GSH. According to the wage-leadership hypothesis "all wage comparisons are assumed to be made with respect to one singular leading sector or key group of mutual leading sectors in the spillover system".[2] These basic hypotheses have given rise to a number of refinements in an attempt to provide the institutionalist theories with valid micro-behavioural foundations.

However the concepts invoked by the institutionalists often turn out on close inspection to be remarkably flimsy constructs; in certain cases they resemble attempts at "post hoc" rationalisation of a particular set of data, a sort of "scrabble" game, in search of an elusive pattern or in an attempt to fit the data into some preconceived schema. Besides the institutionalist models are based on certain critical assumptions on which the validity of the whole exercise depends. On the other hand, the institutionalist school provides interesting insights into the process of wage determination in a world of organised

and/...

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1. J Burton and J Addison: op.cit. p.336.
2. Idem, p.336

and interdependent labour markets and to that extent it can make an important contribution to the study of wage determination in these markets. Its criticism of the neo-classical theory rests on the fact that the theory ignores the importance of institutional factors in the process of wage determination and cannot provide an adequate framework for the analysis of labour markets in which social, political and institutional factors have traditionally played an important role. The institutionalist theories of wage determination reject attempts at abstract theorizing about labour and wages and insist on the importance of the inter-dependency between labour markets based on "imitative economic behaviour" on the part of both trade unions and employers.

Institutionalist Theories and Dependent Economies

THE PRODUCTIVITY GROWTH LEADERSHIP (P.G.L.)/HYPOTHESIS AND THE EDGREN-FAXEN-ODHNER (E.F.O.) MODEL

Two wage leadership hypotheses deserve special consideration as they may have some bearing on our study of the part played by the sugar industry in the evolution of wages in the Island. They are the Productivity Growth Leadership (PGL) hypothesis and the Edgren-Faxen-Odhner (EFO) model. The PGL hypothesis asserts that money wages in the leading sector will increase at the same rate as real labour productivity in that sector. Money wages in other sectors will tend to follow the rate of wage increase in the leading sector but, by hypothesis, the rate of labour productivity in these sectors will be lower than in the leading sector; as a result the rate of price inflation in any sector 'i' will be equal to the difference between the rate of productivity in the leading sector and sector 'i'.

These/...

These propositions can be expressed in notational form as follows:

Let $\dot{W}_t^l$ be the rate of wage increase in the leading sector, $\dot{V}_t^l$ the rate of increase in labour productivity in that sector, $\dot{W}_t^i$ the rate of increase in sector i and $\overline{\dot{P}_t}$ the average rate of price inflation in the economy. (The dots refer to the proportional rate of growth of the variable to which they are attached. The bar over a variable refers to the economy-wide average). According to the PGL hypothesis,

$$\dot{W}_t^l = \dot{V}_t^l \qquad (1)$$

$$\dot{W}_t^i = \dot{W}_t^l \qquad (2)$$

$$\dot{P}_t^i = \dot{W}_t^i - \dot{V}_t^i \qquad (3)$$

$$\overline{\dot{P}_t} = \dot{V}_t^l - \overline{\dot{V}_t} \qquad (4)$$

Equation (1) asserts that money wages in the leading sector will increase at the same rate as labour productivity in that sector. Equation (2) states that money wages in other sectors will follow the rate of wage increase in the leading sector. According to equation (3), the rate of price inflation in sector 'i', will be equal to the difference between the rate of wage increase in sector i and the rate of increase in labour productivity in that sector. This assumes mark-up pricing in all sectors and a constant percentage mark-up. By aggregating equation (3) across all the 'i' industries, we obtain equation (4) which asserts that the average rate of price inflation is equal to the difference between the productivity growth in the leading sector and the average rate of productivity growth in the rest of the economy.

The/....

The fundamental assumptions of the E.F.O. model are: wages in the "exposed" or export sector are constrained by the international price movements and, secondly, the "exposed" sector is the leading sector in the wage determination system with the highest rate of growth of labour productivity. The rate of wage inflation in the sheltered sectors adjusts to equality with the rate of wage increase in the leading sector "due to a compound of spillover, collective bargaining and market forces."[1] Wage inflation imported via the exposed sector is thus predicted to ripple through the rest of the economy because of the wage-following behaviour of sheltered industries. In the exposed sector, the ratio of total wage to total non-wage income (or profits), is constant in the long run at a level that is consistent with mutual equilibrium in the labour, product and real capital markets. The long-run consistency of wages and profits is due to the presence of negative feedback effects that pull the rates of growth of wages and profits in the exposed sector on to a main course or corridor - i.e. a steady-state growth path.

Although the E.F.O. model has been shown to be of little practical value for the analysis of the process of wage determination even in the context of the small open (Nordic) economies for which it has been formulated,[2] its main merit in our opinion lies in the importance it gives to international price movements, which it places at the centre of the wage determination process.

In that/....

1. J Burton & J Addison, op.cit. p.356.
2. The model appears to have been accepted as a "reasonable explanation" of price and wage developments in the Swedish environment, without any rigorous econometric investigation. J Burton & J Addison, op.cit. p.356.

In that respect, the model may be of interest to the small dependent economies like Mauritius and deserves a place in this chapter. On the other hand, the mature-economy vintage of the E.F.O. model, and particularly the postulated long-run consistency of wages and prices, is at variance with the situation in small dependent economies,[1] characterised by a general lack of association, or incohesiveness, between the key macro-economic variables: employment, wages, productivity, GDP and prices.[2]

Both the PGL and the EFO models of wage inflation may have some relevance for the analysis of wage policy in Mauritius where the price of sugar plays an important role "at the centre of the stage" in the formulation and implementation of labour policy.[3] Recent events in Mauritius may provide "circumstantial evidence" in support of this assertion. We shall make only a passing reference to these events at this stage.

In 1963,/...

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1. For a definition of the term "dependent economies", see P Selwyn, op.cit. pp7,8.
2. In an empirical analysis of employment growth in Trinidad, Brewster(a) found no evidence of an association between price and wage movements, an indispensable condition for a stable wage/profit ratio.
   (a) H Brewster. The Growth of Employment under Export Biased Underdevelopment. Trinidad. Social and Economic Studies. Vol. 21, No.2, June 1972, p.158.
3. P Hein: A Model of an Export-Propelled Economy: The Case of Mauritius. Social and Economic Studies, Vol. 17, No.3, September 1968.

In 1963, sugar fetched a record price on the world market. There was also a record crop in Mauritius in that year. As a result the proceeds of the sugar crop amounted to Rs 405 million, an 86 per cent increase on the average annual proceeds over the previous four years (1959-1962). A similar situation occurred ten years later, in 1973 and 1974: the combination of a record crop and a record sugar price. The 1973 crop was the largest ever produced in the Island and the 1974 crop, the second largest. The value of sugar sales shot up to Rs 568 million in 1973 (a 70 per cent increase over the average for 1969 to 1972) and Rs 1,308 million in 1974 (over 130 per cent higher than the 1973 figure.)

Those years of record sugar proceeds brought significant changes in the Government labour policy. In 1963, Wage Councils were set up, which awarded a 25 to 30 per cent increase in wages to field and factory workers in the sugar industry. Subsequently wages councils were set up in many other sectors and the measures taken in the sugar industry were imitated in these sectors. Likewise, the years after 1972 saw a series of general wage increases, applying to all the wage-regulated sectors indiscriminately. Those increases are detailed below. On the other hand 1965 to 1968 were years of low prices, stagnating sugar production and tight money and wages remained relatively stable in spite of the increase in the cost of living.

The influence of international price movements on the rate of wage increase appears clearly in Figure I. International prices influence wages in Mauritius in two ways: firstly export prices determine the capacity of export industries and

Government to pay higher wages;[1] and secondly import prices determine to a large extent the rate of increase in the Consumer Price Index (CPI),[2] hence the rate of increase in the statutory minimum wage (which is linked to the CPI by the Cost of Living Allowance (COLA)).

From Table 12 and Figure I below, it appears that in 1963, the rate of wage increase matched closely the rate of increase in the sugar export price. During the ensuing four years (1964 to 1967), wages remained stable as the sugar price sank to its lowest post-war level. In 1968 a moderate (7.5%) increase in the CPI resulted in a 5% increase in wages. Finally there was a sharp sustained increase in wages after 1970, under the combined effect of skyrocketing sugar price and galloping inflation.

A superficial analysis of the data thus shows that international prices had a strong influence on the rate of wage increase of agricultural (i.e. sugar industry) labourers. This evidence conforms with the assumption of the EFO model, that wages in the exposed sector are determined primarily by international price movements.

TABLE 12/...

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1. See below: Chapter 4, pages 262 (Table 34) and 263.

2. M Pochun: The Determination of Import Prices in Mauritius. University of Mauritius, mimeo.

T A B L E 1 2 : Sugar Prices, Consumer Price Index and Wages of Agricultural Labourers

Year	Index of average[1] sugar price ex syndicate	Consumer Price[2] Index	Index of wages[3] of Agricultural labourers
1959	100	100	100
1960	107.5	102	100
1961	93.5	101	100
1962	94.5	101	100
1963	126	100	125
1964	92.4	102	125
1965	87.3	104	125
1966	89.9	106.1	125
1967	90.5	108.1	125
1968	91.4	116.2	131.3
1969	95	118.2	131.3
1970	100.6	120.2	131.3
1971	111.4	120.63	143
1972	136.8	127.1	171
1973	168.6	144.2	220
1974	400.4	186.2	302
1975		213.6	392

1. The average sugar price ex syndicate is the net price paid to producers after deduction from f.o.b. price, of marketing charges, export levies and duties but before deduction of the Sugar Insurance Fund premium.

   Source: Annual Reports, Mauritius Chamber of Agriculture.

2. Source: Bi-Annual Digest of Statistics

3. Source: (1959-1971) Annual Reports of Labour Department. P Hein: "Les Relations Industrielles à l'Ile Maurice", Op.cit. Ch 3 page 153.(1971-1975) Annual Report. Mauritius Employers Federation, 1976.

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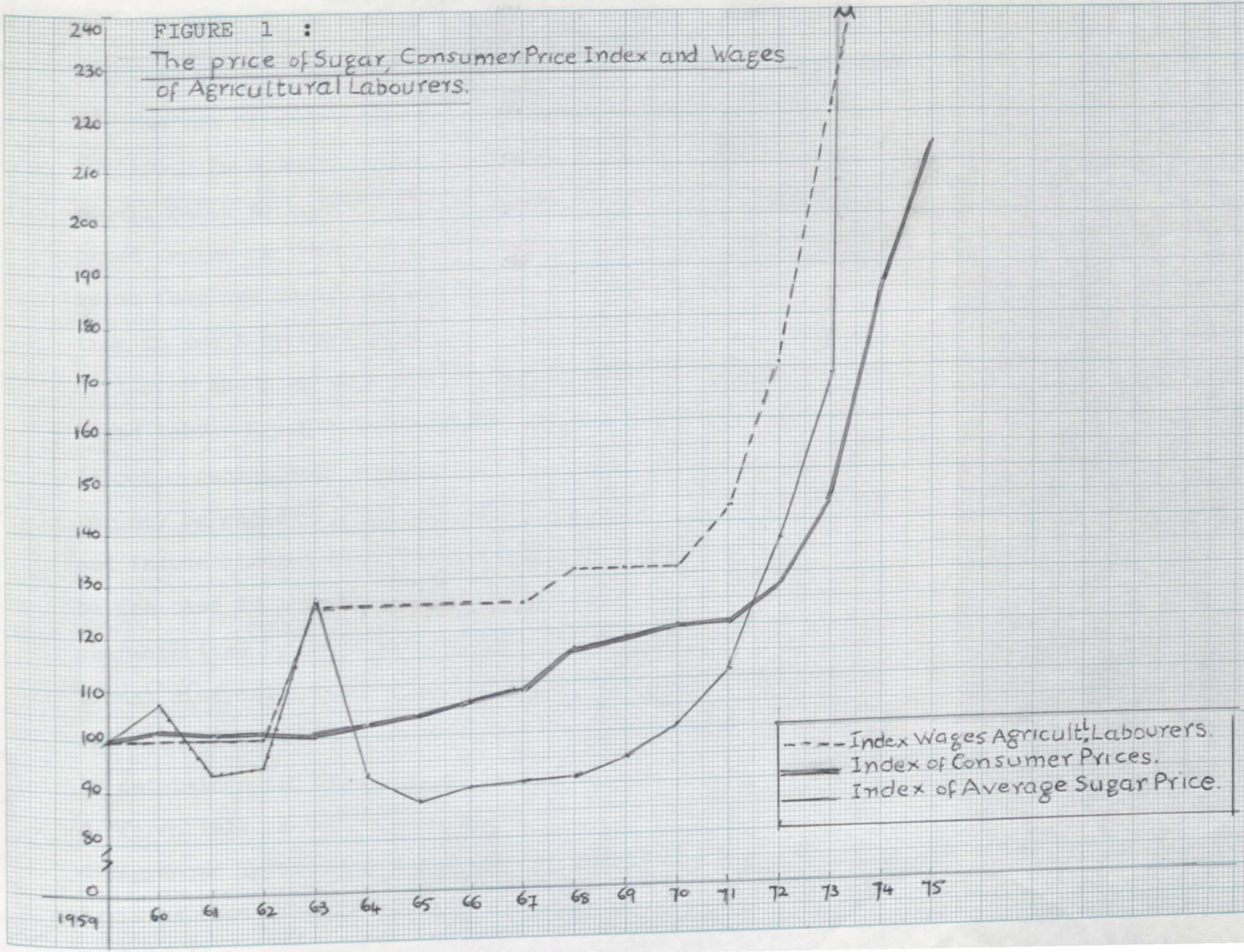
FIGURE 1 :
The price of Sugar, Consumer Price Index and Wages of Agricultural Labourers.



There is however in our opinion, a fundamental problem concerning the use of wage-leadership models for the analysis of wage behaviour in Mauritius and other developing countries. These models refer to industrialised labour markets with a sophisticated system of industrial relations and the assumptions on which they are based may not be relevant to the labour situation in small crowded plantation economies like Mauritius. Spill-over theories of wage determination assume a well-articulated labour market, homogeneous labour force and strong labour organisations so that wage changes in a particular sector may be rapidly and powerfully transmitted to other sectors and induce changes in these sectors. This would not seem to be the case in a segmented labour market like that of Mauritius characterised by fairly rigid social barriers where the occupational distribution of the population is explained to a large extent by its ethnical composition,[1] and tradition still largely determines the structure of wages in each sector. "Skill differentials in less developed countries are overwhelmed by differences in attitudes which have no such obviously rational basis as that of skill or responsibility. Racial differentials, differentials in wages of large enterprises,[2] some of these non-skill differentials exist in apparent defiance of labour market circumstances. "There is a very large random or accidental element in wage differences ... very wide variations in pay are possible even within a single town because local labour markets are often highly imperfect with limited labour mobility and circulation of information among workers so that individual

rates/...

1. See above Chapter 2, page 95 et seq.
2. K Taira: Wage differentials in developing countries. A survey of findings. International Labour Review, Vol. 93, No.3, March 1966, pp.284, 285.

rates may vary widely on either side of the norm ..."[1] Besides enterprises often operate in a traditional environment in which relations are on the basis of rights, obligations and privileges rather than effort and due payment.[2]

Without the necessary conditions for the effective operation of a system of collective bargaining, labour organisations have little market power and must have recourse to state intervention in order to secure terms of employment which they could not otherwise achieve. This tends to blur the distinction between collective bargaining and political action. "The effectiveness of economic strategy depends to a large extent on relative scarcity while the power of political weapons is positively related to numbers"[3], or as H A Turner puts it "workers' capacity for industrial conflict may be negligible but their political influence is considerable ... indeed the strike is often a demonstration to influence the authorities rather than the means of direct pressure on employers.[4]

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Before we conclude this section we provide a statistical test of Meade's assertion regarding the influence of the sugar industry as a wage leader on other sectors of the Island labour market.

Evidence/...

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1. H A Turner, op. cit.
2. Refer to Chapter 2, pp.98/99 regarding the role of job contractors in the recruitment and payment of field labourers on estates.
3. A Sturmthal: Economic Development and the Labour Movement in Industrial Relations and Economic Development (A M Ross (ed) - International Institute of Labour Studies, Geneva).
4. H A Turner: op.cit.

Evidence of wage leadership can be obtained by means of a simple least-squares regression analysis of the relationship between changes in the earnings of workers in the sugar industry and other sectors.[1] Following the procedure adopted by Knight for Zambia, we regressed the absolute changes in the average earnings of daily-paid workers in (i) Docks and Stevedoring, (ii) Central and Local Government and (iii) all sectors except sugar, on the absolute changes in the average earnings of labourers in the sugar industry, over a period of nine years or eighteen bi-annual observations.[2] The following equation was used: $Y_{tj} = a + {}^{b}X_{t}$; $j = 1, \ldots, 3$), where Y refers to the absolute changes in earnings of daily-paid workers in the docks (1), Government (2) and all sectors except sugar (3), and X refers to the absolute changes in earnings of sugar industry labourers during the corresponding period.[3] The results obtained gave low r^2 values. We also analysed the relative changes in earnings of daily-paid workers in the sugar industry and these other sectors. This change in the specification of the data did not improve the results. In fact the regressions based on relative changes in earnings yielded even lower values than those using absolute changes.

We then/...

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1. J B Knight in C Elliot (ed): Constraints on the Economic Development of Zambia, op.cit. Chapter 4, pp.99 and 100.
2. Data on the average earnings of daily-paid workers were obtained from the Bi-Annual Survey of Employment and Earnings in Large Establishments and consist of the amount of wages paid on the last Thursday of March and September divided by the number of wage earners.
3. As there is a pronounced seasonal element in the earnings of sugar industry labourers and dock workers, changes in earnings in these two sectors were based on the corresponding period of the previous year, instead of the immediately preceding period.

We then regressed the average earnings of daily-paid labour in these sectors on average earnings in the sugar industry by means of a double-log equation. A double log equation assumes that proportionate increases in the dependent variable are associated with proportionate increases in the independent variable. But the reason for the choice of a log function in this case was that it gave better results than an ordinary linear one. On the other hand, the use of logarithms precluded an analysis of the changes in earnings because some of these observations had negative values. We also included a dummy variable to allow for structural breaks in the data, particularly with reference to the changes which have taken place in the relationship between different sectors with regard to earnings as a result of a fundamental change in Government wage policy after 1971.[1, 2] We used the following equations.[3]

$$\ln Y_{tj} = \ln a_o + b_1 \ln X_t + b_2 D_t + b_3 D_t \ln X_t + \ln u_t \quad (j = 1, 2, 3)$$

where the symbol $\ln$ refers to natural logs, Y_t and X_t have the same meaning as before and $D_t = 0$ for $t = 1, \ldots, k-1$,

and $D_t = 1$ for $t = k, \ldots, T$.

The results are given below.

(1)/...

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1. See below Chapter 3, p.139.
2. The use of the dummy variable enables the testing of the hypothesis that the structure has been significantly altered in terms of the parameters a and b and also provides estimates of their values. On the use of dummy variables in multiple regression equations, see G S Maddala: Econometrics, Ch 9, pp.132-141.
3. In the case of a single discretionary change in the period covered, this form of equation provides estimates of the coefficients of the dummy variables.

(1) Docks and Stevedoring:

$$\ln Y_1 = 0.3448 + \underset{(2.5327)}{1.2382}\ \ln X_t + \underset{(.2283)}{0.2671}\ D_t - \underset{(-.3399)}{0.205}(D_t \ln X_t) + \ln u_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

(figures in brackets refer to 't' values).

Given that the coefficients of the dummy variables - b_2 and b_3 - are not significant, the regression was run without the dummies and the following results were obtained:

$$\ln Y_t = 0.8910 + \underset{(5.9959)}{.9172}\ \ln X_t + \ln u_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

In this regression, the coefficient of b has a value of .9; it is also highly significant. All the other statistical results (r^2, F ratio and the Durbin-Watson test) are satisfactory. It would appear from these results that the rate of earnings in the sugar industry has a strong influence on the rate of earnings in the Docks - a 10 per cent increase in average earnings in the sugar industry would lead to a 9 per cent increase in average earnings at the Docks. These results conform to the fact that the Docks have traditionally been closely associated with the sugar industry, both at the level of management and labour organisation, and the wage rates and conditions of employment in the sugar industry tended to be imitated in the Docks for comparable grades of labour.[1]

(2)/....

1. It is customary for the dock workers union or staff association to refer to the rates paid in the sugar industry in the course of wage negotiations.

(2) Government

Regressing the average earnings of daily-paid workers in Government against the earnings in the sugar industry, gave the following results:

$$\ln Y_{t_2} = 1.4747 + \underset{(.5527)}{0.1442}\ \ln X_t - \underset{(1.9614)}{1.2253} D_t + \underset{(2.0623)}{0.6668}(D_t \ln X_t) + \ln u_t$$

The coefficient of X_t is not significant. This would imply that earnings in the sugar industry have no significant influence on earnings in the Government sector. As we shall argue below,[1] wages in Government are determined by a different set of factors than wages in the sugar industry. Government wages are determined institutionally and independently of the level of employment and productivity.

But the coefficients of the dummy variables are both significant at the five per cent level, implying that the changes in Government policy after 1971 had a significant influence on the relationship between earnings in these two sectors.

(3) All sectors except sugar

The third regression gave the following result:

$$\ln Y_t = 1.3877 + \underset{(1.3660)}{0.2343}\ \ln X_t - \underset{(3.3979)}{1.7835} D_t + \underset{(1.6574)}{0.8769}(D_t \ln X_t) + \ln u_t$$

The/...

1. See below Chapter 3, p. 194.

The differential intercept (b_2) and slope coefficient (b_3) are statistically significant, b_2 at the 5 per cent level and b_3 at the 10 per cent level.[1] This confirms the hypothesis that the structure of the relationship between earnings in the sugar industry and all other sectors has been altered significantly following the change in Government labour policy. By the use of the dummy variable, we can obtain estimates of the parameters for the earlier and latter structure:[2]

(i) April 1966 - March 1972: $\ln Y_t = 1.3877 + 0.2343 \ln X_t + \ln u_t$

(ii) September 1972 - September 1975:

$$\ln Y_t = (1.3877 - 1.7835) + (0.2343 + 0.8769) \ln X_t + \ln u_t = -0.3958 + 1.1112 \ln X_t + \ln u_t.$$

These results are interesting. While the elasticity of earnings in All Other Sectors with respect to earnings in the sugar industry (the estimate of the slope term), is equal to .23 in the first case (and not statistically significant), implying little or no response of earnings in these sectors to earnings in the sugar industry, there is a sharp and significant increase in the relation between earnings in other sectors and earnings in the sugar industry in the second period when the coefficient of elasticity rises to 1.11. This is what we would expect from the fundamental change in Government labour policy and the uniform wage increases across-the-board decreed by Government since 1972.

The/...

1. Regarding the use of differential intercepts in regression analysis see D Gujarati: Basic Econometrics McGraw Hill. 1978, Ch 13, pp.291-293.

2. Parameter estimates a_o and b_1 for the earlier structure are given directly by the equation; estimates for the latter structure, can be obtained as $(a_o + b_2)$ and $(b_1 + b_3)$ respectively.

The Evolution of Wages and Earnings in Mauritius

The 1963 Wage Orders

In 1963 wages councils were set up to fix the wages and conditions of employment of workers in the sugar industry. The wages councils recommended a general increase in wages of about 25 per cent for agricultural workers and 30 per cent for non-agricultural workers. The table below gives the minimum rates fixed by Government on the recommendation of the wages councils:

TABLE 13 : Minimum Wages Fixed for Workers Employed in the Sugar Industry by the Wages Regulation Orders, 1963

Category of Worker	Minimum wages (in rupees)	
	Monthly-paid workers	Daily-paid workers
Factories		
Men : Class I	113.50	5.70
" : Class II	101.50	5.00
Women	75.25	2.75
Young persons (male)	75.25	2.75
Supervisors:		
Men sirdars (foremen)	140.00	7.50
Class I	132.75	7.10
Class II	110.50	6.50
Field labourers:		
Men: Class I	113.50	6.50
" : Class II	101.50	5.00
Women: Class I	75.25	3.25
" : Class II	67.25	2.75
Young persons: Class I	75.25)	2.75
" " : Class II	67.25)	
Children	52.50	1.75

From: D P Chesworth Statutory Minimum Wage Fixing in the Sugar Industry of Mauritius - International Labour Review, Vol. 96, No.3, September 1967, p.10.

Following the establishment of Wages Councils in the sugar industry, these measures were extended to other sectors and wages and conditions of employment were regulated by Government for a large part of the labour force. In 1970 it was estimated that about 50 per cent of the workers in the private sector, 70,000 out of 136,000 persons, were covered by Wages Councils, another 10 per cent were covered by collective agreements and the remaining 40 per cent belonged to the informal sector working in small establishments, small scale enterprises and households.

In the years after 1963, little changes were made to the level of wages in the sugar industry or in the Island generally. Industrial relations went through what may be described as a period of consolidation after the sweeping changes of 1963 - 1965 and in the face of a deterioration in the financial position of the industry.[1] 1968 was a year of stress and difficulties for industrial relations in Mauritius. The rupee was devalued in 1967, at the same rate as the pound sterling, and the substantial increase in consumer prices which followed, led to claims from various sectors for a readjustment of wages. In support of their claim for a wage increase, the Plantation Workers Union, went on strike for one day in October 1968, with the avowed intention of bringing pressure on Government for an increase in wages.[2] Government gave in and accorded an

increase/...

1. Since 1963 the world sugar price had been depressed and in November 1966 the London daily spot price actually dropped below £14 a ton to the lowest figure since the Second World War. D P Chesworth, op.cit. p.28.
2. This was the first time that a large union used strike action to secure an increase in wages within the framework of the new wage fixing procedure, although there had been a number of industrial conflicts involving individual estates, concerning the interpretation or implementation of the Regulations.

increase of 5 per cent to the sugar industry workers. It was also announced that the rates of pay of manual workers employed by Government would also be increased by 5 per cent (though the decision concerning government workers was only implemented in July 1960).

Industrial Unrest in 1971

In 1970, the Wages Councils granted a 5 per cent increase in the rates paid for cutting and loading operations. A similar increase was granted to certain categories of workers in other industries: i.e. office messengers and mechanics in the Bus Industry and a 3 per cent increase to Dock Workers. The following year, 1971, was marked by considerable industrial unrest and prolonged strikes in the harbour and public services, particularly electricity and transport. This period of industrial unrest had political as well as economic motives and was associated with the emergence of a new radical leftist party. An arbitration tribunal, appointed by Government to settle the industrial dispute in the harbour, awarded a 12 per cent increase in wages. Following the award the demand for a similar increase in other sectors became more pressing and at the beginning of 1972, Government granted a 12 per cent increase to all Government employees, those of para-statal bodies and most wage regulated sectors of the economy; the increase to take effect from November 1971. Bus industry and sugar industry workers obtained increases of 15 per cent and 22 per cent respectively.

In the following year, 1973, Government appointed a Salaries Commission to undertake a large scale review of salaries in the public service; the objective was to realign the conditions in

the public/....

the public service with those in the private sector. This resulted in an average increase of about 30 per cent for all grades of public officers. These increases disturbed the existing wage differentials between the Government and non-government sectors and led to widespread claims for adjustment from non-government employees. As Government employs the large majority of persons in "white collar" occupations it is an important "pace-setter" with regard to the conditions of employment in these sectors.[1] The percentage of people employed by Government in different "white collar" occupations in Mauritius are given in the following table.

T A B L E 1 4 : Employment by Occupation and Industrial Group

ISC Code	Occupation	Govt: Central & local, including Development Works Corporation	Total Employment	%
01	Physical scientists and related technicians	119	164	73
02/03	Architects, Engineers and related technicians	197	928	21
06/07	Medical, dental, Veterinary and Related workers	2897	3097	90
1-3	Teachers	7627	10395	73
3	Clerical and Related Workers, Clerical Supervisors	5870	15846	37
5	Service workers, catering services, housekeeping, care-takers	7842	14719	53
7	Production supervisors and general foremen	1499	3465	43

SOURCE: Central Statistical Office. Employment by occupation, Industrial group and sex - March 1977.

These/...

1. C R Frank: Urban Unemployment and Economic Growth in Africa. Oxford Economic Papers: No.2 July 1968, p.264.

These pressures induced Government to decree a general increase in salary of 20 per cent for private (i.e. non-government) employees.

The COLA (Cost of Living Allowance)

The 1973 Salaries Commission established the principle of a Cost of Living Allowance or (COLA). That allowance was based on a graduated scale linked to the rate of increase in the Consumer Price Index (CPI). After 1972 the island entered a phase of rapid inflation. This was a new experience for Mauritius, where prices had remained relatively stable throughout the previous decades. Henceforth the problem of the COLA dominated the sphere of industrial relations. Two COLAs were awarded in 1974. Two more COLAs were granted in 1975 as Government tried to cope with a galloping rate of inflation. The original scheme had provided for a maximum allowance of Rs 500 per month for salaries exceeding Rs 2,750 - linked to a maximum price increase of 32.5 per cent over the December 1972 CPI. As prices soared the original provision rapidly proved inadequate and Government granted two additional allowances in 1975. Details of wage and salary increases after 1973 are given below:

	Rate of COLA
From 1st January 1974	7 to 10 per cent of wages (corresponding to 1st column of Report of Salaries Commissioner)
From 1st July 1974	17.5 to 25 per cent of wages (corresponding to 4th column of Report)
From 1st January 1975	Additional allowance of 6 per cent of total wages (including the COLA) subject to a maximum of Rs 67.50 per month.
From 1st July 1975	Additional allowance of 6 per cent of total wages (including COLA) subject to a maximum of Rs 67.50 per month.

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Government labour policy after 1963 can thus be divided into two distinct phases. Firstly the period 1963 to 1972, which s saw a proliferation of Wages Councils and the regulation of wages and conditions of employment in specific industries and the period after 1972, when Government labour policy took the form of a series of general and uniform wage increases covering both Government employees and other sectors of employment. There were a number of reasons for this fundamental change in Government policy. The first reason was the prosperity and windfall profits of the sugar industry. Ten years after the record 1963 crop the industry again experienced a record output and record sugar prices.[1] This time however the period of prosperity lasted somewhat longer than in 1963. The 1973 crop amounted to Rs 568 millions, while the 1974 crop produced Rs 1.308 millions. Consequently those wage increases can be seen in the first instance as the direct result of the prosperity of the sugar industry, which provided Government with the necessary financial resources for satisfying its natural inclination to "largesse" in labour matters.[2]

Secondly there were important differences in earnings between the different sectors of employment, a symptom of the segmentation and imperfections of the labour market to which we have already referred.[3] The wide dispersion of wages also reflected the chronic weakness of labour organisations in the Island.[4] There was also growing unrest in the sphere of industrial

relations/...

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1. See above page 123.
2. H A Turner: op.cit.
3. The inherent imperfections in the Island labour market may well have been made worse by the action of the Wages Councils.
4. For a measure of the dispersion of earnings in the Island labour market, see below page 158 Table 17.

relations in the wake of the emergence of a new radical political party which gained control over important sectors of organised labour. Thirdly, an unprecedented high rate of inflation strained the socio-economic structure and revealed the stresses and contradictions in the Island labour market.[1] This combination of factors, in a rapidly changing social and political environment, induced Government to yield to the demands and pressures of labour lobbies and grant substantial and general wage increases at a price of aggravating an already unbalanced labour market.

The Structure of Earnings: Preliminary Observations

Although oligopsony in the strict sense of the term, is somewhat rare in developing countries, labour markets in many sectors are dominated by a few large firms.

Where there is a high degree of labour mobility, i.e. in a competitive labour market, economic theory predicts that the wage paid to a given category of labour will be similar among firms operating in that market. This may explain the tendency for

employers/...

1. Inflation and Industrial Disputes 1974-76

Year	Annual Aver.% change in CPI	No of stop-pages	No of workers involved	Man days Lost				
				Agric	Manu.	Trans. & Com.	Others & mis.	Total
1974[a]	29.1	14	4614	1906	190	3600	56	5752[b]
1975	14.7	69	81075	62752	44904	13542	1872	124495[b]
1976	12.1	98	68512	6702	38738	8659	60314	114458[b]

Out of 181 stoppages during that period, 62[c] were due to wage disputes.

SOURCE: Annual Reports of Labour Department. Government Printer, Port Louis.

a. The figures relate to the second part of the year (June to December 1974).

b. There was in the published figures a small discrepancy between the number of mandays lost in individual sectors and the total.

c. This figure is arrived at as follows: 1974/75: 11 + 1975/76: 36 + June to Dec. 1976: 15 = 62

employers in the organised sector of labour markets to form themselves into an association and the durability of these associations. These economic considerations however are often overwhelmed in practice by non-economic factors but, for all the reservations and qualifications that must be made when we apply conventional economic models to the analysis of labour markets in developing countries, the degree of employers concentration has certain important implications regarding the elasticity of demand for labour and the impact of minimum wages on the level of earnings and employment.

In the presence of monopsonistic conditions in the labour market, neo-classical theory asserts that the imposition of a minimum wage above the equilibrium wage may actually result in an increase in the equilibrium level of employment, because the minimum wage will produce a kink in the supply curve of labour, which will eliminate the postulated trade-off between wages and employment over a certain range of the (labour) demand curve. This is shown in Figure 2.

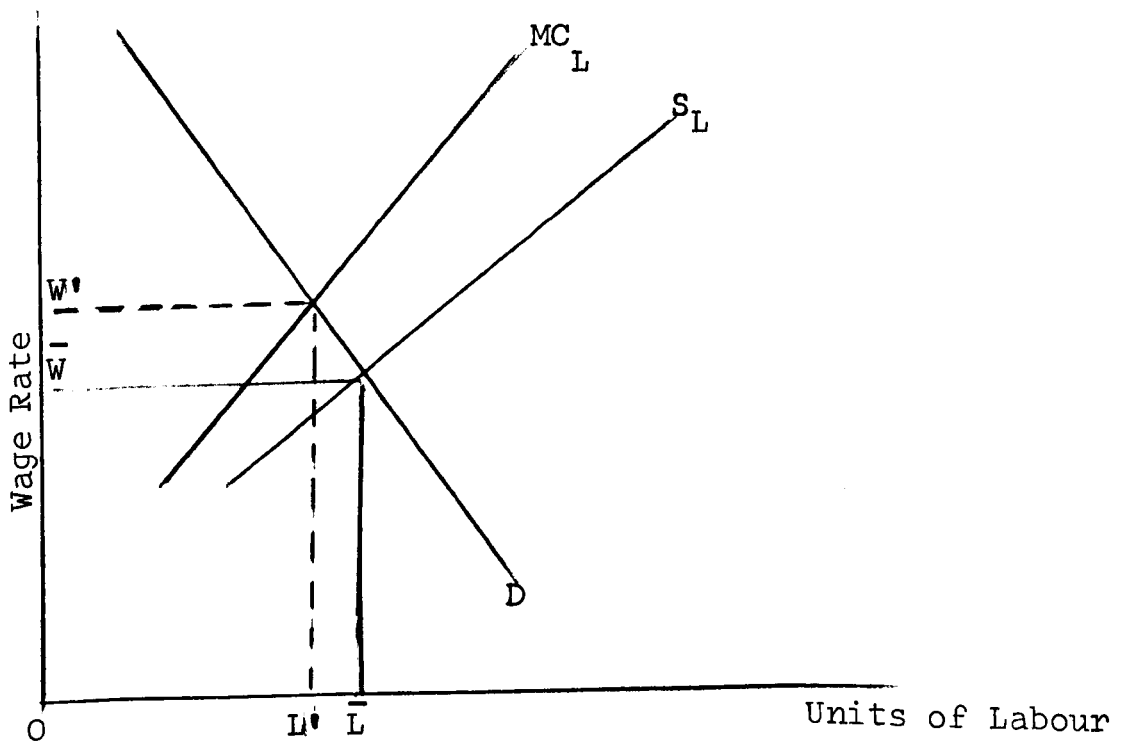

FIGURE 2 : A MODEL OF THE MONOPSONISTIC LABOUR MARKET

In the diagram, S_L is the supply curve of labour, MC_L the marginal cost curve and D is the demand curve for labour which is equal to the marginal revenue product (in a monopolistic product market). In the first case (wage maximisation policy), the minimum wage is fixed at W', in which case OL' units of labour will be employed, the same quantity as before. In the second case (maximisation of employment) the minimum wage will be fixed at $\overline{W}$ and $O\overline{L}$ units of labour will be employed. Thus, in the particular case shown in Figure 2, Government can raise either employment or wages or both employment and wages by the introduction of a minimum wage within the range shown by $L' - \overline{L}$ and $W' - \overline{W}$.

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According to Gregory,[1] the necessary conditions for monopsony in labour markets do not exist in developing countries. He argues that labour supply and demand conditions in these markets are very different from the assumptions of the monopsony model, for the supply of low-skilled labour is likely to be highly - if not - perfectly, elastic to any particular firm while, on the demand side, to the extent that modern firms congregate in a few urban centres, the necessary conditions for monopsony do not exist, "unless one is prepared to argue that such employers collude on wage issues and act as a single buyer."

On the other hand, he concedes that in certain circumstances, where there may be at least potential competition for labour, employers may still behave like monopolists, where there exists

a strong/....

1. P Gregory: Employment Implications of Public Regulation of Wages and Industrial Relations, op.cit. p.3.

a strong conventional element in wages and a certain degree of immobility on the part of workers. Besides, where there are few large establishments, it is relatively easy for firms to organise themselves in labour and other matters. This would appear to be the case in Mauritius, where in most industries there is a fairly high degree of labour concentration and a fairly long tradition of consultation between employers on wage issues. The following figures (Table 15) show the degree of labour concentration among firms in Mauritius. They relate to employment in large establishments.[1]

TABLE 15/....

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1. Large establishments are defined as follows:
   (i) Sugar Cane plantations where 25 arpents or more are harvested;
   (ii) Tea plantations of 5 arpents or more;
   (iii) All 'flue-cured' tobacco establishments, irrespective of acreage;
   (iv) Non-agricultural establishments employing at least 10 persons at the time of the survey;
   (v) All Central and local government departments.

TABLE 15 : Labour Concentration in Mauritius

Industries 1	Employment in large establishments 2	No of firms 3	Employment in 5 largest establishments 4	% Total Employment 5 (4 % 2)	Employment MEF members 6	% Total Employment 7 (6 % 2)
Sugar	48 591	197	18 798	39	44 190[1]	91
Tea	2 175	17	658	30	658	30
Food, Bev. Tobacco	5 118	86	1 830	36	3 458	68
Textiles	17 854	83	4 668	26	7 198	40
Chemicals products	1 038	18	601	58	1 101[2]	100
Engineering	1 726	35	1 281	74	1 647	95
Construction	9 068	32	3 404	38	4 717[1]	52
Stone and Concrete	1 215	30	588[3]	48	588[3]	48
Buses and Road Transport	4 628	12	2 207[4]	48	1 787	39
Other	673	11	449	67	449	67
Stevedoring	3 363	8	3 337	99	3 363	100
Hotels and Restaurants	3 229	46	1 605	50	2 414[1]	75
Totals and averages	98 678	575	39 426	40	71 570	73

SOURCES: (i) Bi-Annual Survey of Employment and Earnings, Central Statistical Office, March 1979.

(ii) Mauritius Employers' Federation: the MEF figures are for June 1980; in a few cases for December 1979.

1. Employment figures are not available for some establishments.
2. There are certain differences between the CSO and MEF classifications.
3. Four largest establishments only.
4. Estimated.

Gregory adds that widespread observation shows that the level of wages for unskilled labour in the modern sector (the only sector in which effective intervention is likely to be found) lies above that for similar classes of labour in other sectors "which suggests that modern sector employers neither possess nor exercise monopsony power."[1] But the higher wage rate of unskilled labour in the modern sector of developing countries may be due to a number of other factors which do not invalidate the proposition of oligopsonistic behaviour on the part of employers. In the first place, these higher wages may result from the segmentation of the labour market and the presence of institutional forces in the modern sector.[2] On the other hand there is a wide range of theories in support of the fact that larger establishments often pay a substantially higher wage than small establishments, which do not need to involve the notion that wages are institutional.[3]

The influence of size on the wage rate paid in various establishments indicates a high degree of institutional rigidity in the wage structure. Institutional rigidity in the process of wage determination implies, in turn, the existence of a segmented labour market. Similar information has not been compiled for Mauritius but a cursory examination of the available data shows that there are important wage differences between large and small firms in the Island. Besides a situation of chronic excess labour, as prevails in the organised sector of many

developing/...

1. P Gregory: Employment Implications of Public Regulation of Wages and Industrial Relations, op.cit. p. 4.
2. In India (1955) and Japan (1954), the average annual earnings per person in establishments employing less than 10 persons was less than half the average earnings in large establishments employing more than 1000 persons. K Taira: Wage Differentials in Developing Countries: A Survey of Findings, op. cit. p.285.
3. These theories are surveyed by N Stern (1978) in a Study of Labour markets in less developed countries op.cit. Ch 3 §3.4, pp.24-30.

developing countries,[1] by reducing the rate of labour mobility may add to the segmentation of the labour market.[2] In these conditions the degree of unionisation of the labour force may lose much of its explanatory power in the analysis of the wage structure.

In the following pages we shall study the evolution of the structure of earnings in the Island in order to determine the part played by non-market forces - trade unions and government - in wage determination. Our aim will be to measure the changes which have occurred in the distribution of earnings between 1966 and 1975, a period when money wages increased at an unprecedented rate, to see how far earnings in different sectors have kept in step with one another. We shall also analyse the influence of Government policy on the structure of earnings. The data relates to the average earnings of monthly-paid and daily-paid workers.[3] These figures have been compiled from the Bi-annual Survey of Employment and Earnings.

Our objective is to look for evidence of a certain pattern or uniformity in wage changes, an underlying relationship which binds together wages and salaries in different sectors. As

mentioned/...

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1. See below Chapter 3, page 186.
2. According to J Stiglitz,(a) the degree of labour mobility in any period will depend on the rate of job creation and the rate of labour turnover i.e. the number of new and replacement jobs available. The rate of labour turnover in turn will depend on the degree of wage disparity and the rate of unemployment.(b)
   (a) J Stiglitz: Alternative Theories of Wage Determination and Unemployment in L.D.Cs.: The Labour Turnover Model. The Quarterly Journal of Economics: Vol. LXXXVIII, May 1974, p.224
   (b) Idem, p.197.
3. When using average earnings as a proxy for wages rates, we must allow for a fairly high degree of imprecision. These data cover different grades of workers and a correspondingly wide range of salaries and wages. They tend to conceal the differences which may exist in the occupational structure of different industries.

mentioned before[1] the complete absence of relationship would be revealed by a wide dispersion of wages earnings and in their movement overtime. By contrast, the persence of strong wage interdependency would result in much uniformity in the rate of change of sectoral earnings and the earnings structure would remain relatively unaltered.

Wage relativities often play a determinant part in union negotiations. Thus the greater the degree of unionisation of the labour force, used here as a proxy for union militancy[2], the more rigid the wage system is likely to be, and the more powerful the transmission mechanism. Alternatively Government may adopt similar criteria in fixing wage rates in different industries or for different grades of labour. Many of the institutionalist theories, especially the wide range of theories which emanate from the wage-leadership hypothesis, presuppose the existence of a well-organised labour market, strong trade unions and an effective system of collective bargaining. Our contention will be that the influence of institutional forces will be positively associated with a strong cohesion between industries with regard to wages. Whereas, where those forces are weak and ineffective, there will tend to be a wide dispersion of wage rates and little uniformity in the rate of change of sectoral earnings.

In our empirical analysis of the wage structure, a comparison of the rate of change in wages and earnings in different industries is more significant than a comparison of the actual rate of earnings in

each/....

1. See Chapter 3, page 112.

2. Robert J Flanagan: Wage Interdependence in Unionised Labour Markets, op.cit. p.636.

each industry; i.e. the relation between the movement of earnings in different industries is more meaningful than the relation between earnings at a particular time. Consider an example: It is often asserted that the rate of wages in the sugar industry will influence wages in other ancillary sectors, i.e. transport, garages and workshops, docks and stevedoring, etc.[1] This is based on the fact that these sectors are satellites of the sugar industry and are closely associated with it both at the level of management or labour organisation. It would appear reasonable to assume a fairly close association between the wage rates paid in the sugar industry and in those ancillary sectors for comparable grades of labour, i.e. between the wages paid to lorry drivers and crews by sugar estates and by the (goods) transport firms, between the wages of mechanics and fitters in sugar factories and in garages and workshops, between that of labourers in the sugar industry and dock workers. But if we compare the wages, or average earnings, of sugar industry workers with those of workers in the other sectors, it is very difficult to detect any relation between them. On the other hand a wide dispersion of wages and earnings between these sectors cannot be considered as evidence of the absence of association between them; the reason being that the nature of the work and system of classification and payment of labour may differ substantially in different industries.

Average earnings . . . are an aggregate of the rates paid to different grades of workers in a given sector or industry, and very rough data for the purpose of the analysis. We must look rather at the movement of wages and earnings, and changes in their structure, over time.

OUr/...

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1. The alleged relationship between the rate of earnings of daily-paid labour in the sugar industry and the Docks is confirmed by the results of the statistical analysis reported on p. 131.

Our analysis of the evolution of earnings in the Island is based on the following assumptions: (1) the wage structure within a given firm is fixed in the short term through "custom and coercive comparisons"[1] and (2) the number of firms in each industry does not alter significantly from one year to the next. The second assumption has been verified in the case of large establishments covered by the Bi-annual survey to which the data relate. As regards the first assumption, it would appear to "fit" local conditions for the reasons given on page 146 and to the extent that labour unions in Mauritius are organised on the basis of firms and industries rather than occupations, the same union representing the different grades of labour in a given firm or industry.[2,3] There would tend to be in these conditions a hierarchy or rigid structure of wages in which the rates paid to any category of labour may be determined by the rates paid to other labour categories within the firm's wage structure rather than by the rates paid to the same category of labour elsewhere. This also conforms with what has been said earlier regarding the segmentation and heterogeneity of the labourmarket in the Island.[4]

We assume/....

R J Flanagan: Wage Interdependence .. Op.cit. p.639.

1. If the wage paid to different grades of labour in a firm or industry increased at the same rate, the increase in average earnings would equal the increase in the wage rate, irrespective of the composition of the labour force.
2. With regard to the specificity of the wage structure in developing countries, see K Taira, op.cit. p.293.
3. P Hein: Les Relations Industrielles à l'Ile Maurice, op.cit. Chapter 3, p.137.
4. The system of wage regulation set up by Government in the nineteen-sixties was organised on an intrafirm or industry basis, Wages Councils fixing wages and conditions of employment for all grades of workers in specific industries; this led to important disparities in the conditions of employment of comparable grades of workers in different industries.(a)

(a) P Hein: op.cit. Ch 3, p.137.

We assume that the wage structure within a firm is fixed in the short term. In this connection, Berry and Sabot[1] have argued that the understanding of the intra-firm wage structure is at present inadequate to judge the degree of rigidity of the wage structure (and the extent to which wages at the bottom of the occupational ladder may influence wages higher up), though, according to them, it would seem improbable that firms would not modify their wage structure if the imposition of a minimum would otherwise greatly increase their wage bill.

The difference in labour classification is more important in the case of monthly-paid than daily-paid workers. Most daily-paid workers belong to the unskilled labour categories in which case, the range of skills is very limited; whereas monthly-paid workers comprise many different grades of labour, from managerial to semi-skilled, and there may be substantial differences in the classification of these workers, which may obscure the changes in wage rates between different industries.

With these preliminary assumptions and observations we can now proceed to analyse the evolution of earnings between different industries in our search for evidence of an association between the wages paid in these industries.

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The/...

1. A Berry and R H Sabot, Labor Market Performance in Developing Countries: A Survey, World Development, Vol.6, No.11/12, November/December 1978, p.1208.

The Evolution of the Structure of Earnings in Mauritius

The average earnings of daily-paid workers virtually doubled between 1966 and 1975. In 1966 sugar industry workers were earning an average Rs 5.56 daily. In 1975 they were earning twice as much i.e. an average of Rs 11.22 daily. Earnings of daily-paid workers in manufacturing were Rs 5.67 in 1967 and had risen to Rs 9.17 on average in 1975. The average earnings of all daily paid workers was Rs 5.63 in 1966 and Rs 10.82 in 1975. The increase in earnings of monthly paid workers was more moderate. In the sugar industry, they earned Rs 302.96 on average in 1966 and Rs 424.06 in 1975. Average monthly earnings in manufacturing went up from Rs 338.67 to Rs 584.73 and in construction from Rs 608.78 to Rs 1006.57. Overall, average monthly earnings rose by approximately 60 per cent from Rs 363.62 to Rs 607.90.

However the increase in earnings was not as regular as those figures would suggest. Some industries led the pace, others lagged behind. Our purpose will be to analyse the evolution of earnings in order to find out what happened to the wage structure during this period of rapid change. We shall compare the experience of Mauritius in this regard with that of other countries, to see how far the changes in the Island wage structure conform to what has occurred elsewhere and in order to assess the influence of systematic relationships within an established wage structure, on the determination of wages and earnings.[1] We shall also analyse the influence of Government wage legislation on the structure of earnings in the Island. We shall be guided in our investigation by certain

hypotheses/...

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1. See above page 113.

hypotheses made by students of labour markets regarding the behaviour of wages and earnings in conditions of rapid change.[1] These hypotheses are based on empirical observations of the changes in the wage (earnings) structure in a number of countries.

Changes in the Structure of Earnings: Theory and Evidence

The Hypotheses

(i) The Reynolds-Taft hypothesis stipulates that the absolute wage (earnings) dispersion tends to reach a maximum at sometime during the early stages of industrialisation and to diminish gradually after that point.[2] According to Papola and Bharadwaj, this widening tendency in the wage structure of the newly industrialising economies, is due to the fact that the pace of change of skills and product-market differentiation is rapid in the early stages of industrialisation and relatively slow in the later stages.

(ii) Over a period in which a secular rise in wages takes place, absolute wage differentials widen while percentage differentials decline.[3]

(iii)/...

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1. We refer especially to the article by T S Papola and V P Bharadwaj, on the Dynamics of Industrial Wage Structure: An Inter-country analysis (Economic Journal Vol.LXXX, March 1970) and the study by L Reynolds and P Gregory of the changes in the wage structure in Puerto Rico, in L Reynolds and P Gregory: Wages, Productivity and Industrialisation in Puerto Rico. Homewood. Illinois R D Irwin Inc. 1965. Papola and Bharadwaj give an extensive list of references in support of these hypotheses. A brief explanation of the Reynolds-Taft hypothesis is given below.
2. The hypothesis would appear to have been verified in the case of India during the period of planned industrialisation (1953-1961). T S Papola and V P Bharadwaj, op.cit. p. 72 footnote 6.
3. An expansion or contraction of the wage differentials is generally measured by the coefficient of relative dispersion or coefficient of variation. This is equal to the $\frac{\text{absolute dispersion}}{\text{mean}} \times 100$. An increase in the relative dispersion therefore implies that the absolute dispersion (or Standard Deviation) has increased relatively faster than the mean.

(iii) The relationship between the wage level and absolute and relative dispersion may be explained in terms of changes in the price level. It has been observed that inflation tends to widen the absolute differentials and reduce the relative differentials. The reason for this is that inflation leads to an increase in wage rates, and thus tends to widen absolute differentials; while at the same time, the relative differentials decline due to the increase in the mean wage..

This explanation of the change in wage structure in terms of price level involves the following assumptions:

(a) Wage and price levels are highly correlated

(b) Wages increase "in the order of their initial levels", so that absolute differentials widen

(c) The increase in the mean is proportionately larger than the increase in the absolute dispersion so that the relative differentials decline.

Papola and Bharadwaj[1] have analysed the changes in the wage structure in a number of countries. They have found a close correspondence between the movement of wages - or earnings - and the consumer price index. From their observations one might conclude that inflation generally tends to widen absolute wage differentials. On the other hand increases in wage level and absolute dispersion have, as often as not, been accompanied by a decline in the relative dispersion.

(iv)/....

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1. T S Papola and V P Bharadwaj: op.cit. p.80.

(iv) An increase in the absolute dispersion is generally brought about by lower absolute increases in wages in low-wage industries as compared with high-wage ones; and a decrease in absolute dispersion by larger absolute increases in the former than in the latter. Similarly a widening or narrowing of the relative dispersion is brought about by higher or lower percentage increases, respectively, in the high wage than in the low-wage industries.[1] This would imply that the widening tendency in wage differentials in the face of a rapid increase in wages may be checked by Government regulation (especially Minimum Wage Legislation), or by a system of compensation negatively related to workers' earnings.

(v) Regarding the relationship between minimum wages and the level and dispersion of wages in poor countries, Jackson[2] inferred two characteristic processes. In the first one, wages in "a key" sector advance rapidly and the legal minimum is adjusted to follow, though not necessarily in proportion; groups between the minimum and wage leaders also struggle to restore their relative wage position, but with varying success. In the alternative process, workers paid above the minimum then strive

- again/...

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1. In support of this hypothesis Papola and Bharadwaj have calculated the correlation coefficient between the earnings in the initial year and increases therein over selected periods. These coefficients are significant and positive for almost all countries during periods when the absolute differentials have widened. On the other hand the coefficients are negative in countries where there has been a decline in absolute differentials. Similar - if somewhat less clear-cut or significant - results are obtained in the case of relative differentials: a positive correlation coefficient in almost all countries where relative differentials have increased and a negative one where they have narrowed. T S Papola and V P Bharadwaj, op.cit. pp.81,82.

2. (See footnote next page).

> - again with varying success - to maintain their previous margin with the base. Either of these mechanisms could produce both a comparatively wide dispersal of wage movements and considerable instability in the wage hierarchy. They also imply ... that distortions of the wage structure is much more likely to occur in the under-developed economies than in the developed ones.

These hypotheses provide the theoretical framework for the analysis of the changes in inter-industry differentials in Mauritius. In the following pages we shall analyse the evolution of earnings between 1966 and 1975 in order to find out what has happened to the relative wage levels during that period. We shall also investigate the influence of Government wage legislation on the structure of earnings.

The first proposition relates to the existence of wide wage differentials in the early stages of industrialisation. The postulated widening of wage differentials is attributed to differences in the conditions of supply of unskilled and skilled workers. In the face of extensive underemployment, supply of the former is expected to be perfectly elastic at or near the subsistence wage, while the supply of skilled labour is much more restricted and therefore upward sloping. Rapid economic growth therefore, might be expected to produce a widening of wage differentials. The operation of market forces may be altered however, by state regulation or trade union action, which may help to raise the price of unskilled labour above its equilibrium level.[1]

In this/....

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2. H A Turner and D A S Jackson: On the Determination of the General Wage Level - A World Analysis: Economic Journal Dec. 1970 referred to in A Berry and R H Sabot: Labour Market Performance in Developing Countries: op.cit. p.1208.

1. Lloyd Reynolds: Wages, Productivity and Industrialisation in Puerto Rico, op.cit. Ch 2, p.73.

In this connection the study of the evolution of the earnings structure in Mauritius between 1966 and 1975 is interesting in two respects: there was during that time a rapid increase in the rate of industrialisation;[1] there was also an extension of Government wage regulation to all sectors of employment.

If we assume that daily-paid workers generally belong to the unskilled group while monthly-paid workers belong to the skilled and semi-skilled categories, we can verify the hypothesis in the local context by comparing the rate of increase in earnings of these two categories of workers. Table 16. below gives the rate of increase for the main industrial groups between 1966 and 1975, for monthly- and daily-paid workers.

T A B L E 1 6 : Index of Earnings of Monthly- and Daily-paid Workers: 1969, 1972, 1975

(1966 = 100)

		1969	1972	1975
Sugar	Monthly	113.0	133.85	140.0
	Daily	106.3	146.04	201.8
Tea	Monthly	114.2	115.77	175.9
	Daily	99.7	115.11	203.5
Construction	Monthly	103.2	114.39	180.0
	Daily	109.1	114.29	198.5
Manufacturing	Monthly	102.1	113.25	172.7
	Daily	116.2	128.96	177.0
Trade	Monthly	111.9	125.58	146.6
	Daily	106.6	106.14	161.9
Transportation	Monthly	109.0	127.81	190.0
	Daily	100.6	116.73	159.7
Government	Monthly	99.9	124.6	182.4
	Daily	108.1	118.54	195.5

SOURCE: Central Statistical Office: Bi-Annual Survey of Employment and Earnings in Large Establishments.

1. (See Footnote next page)

An examination of these figures reveals no evidence of a widening of wage differentials in the rates paid to monthly-paid and daily-paid workers over a period which has seen a rapid rate of industrialisation in the Island. On the contrary earnings of daily-paid workers have risen faster than those of the monthly-paid in all sectors except transportation. These results may be explained by the action of institutional forces, notably Government intervention, in the labour market.[2]

Table 17 measures the changes in the structure of earnings for monthly and daily-paid workers - between 1966 and 1975. There is no clear trend in the evolution of monthly earnings between 1966 and 1971. The average monthly rate of earnings increases slightly (Column 1(a)) and the range of earnings, measured by the ratio of low to high rates, remains fairly stable (Col.8(a)); but a substantial increase in average monthly earnings occurs after 1971, with a rapid expansion of absolute differentials (Col. 3(a)). As regards the average daily rates also there is a definitely increasing trend with some year-to-year fluctuations (Col. 1(b)). The median of monthly rates of earnings (Col. 2(a)) shows some fluctuations in the first three years but increases rapidly and consistently after 1969. Likewise

for/...

1.

	No of Manufacturing Establishments	No of Employees
1966	160	7031
1975	280	22483

SOURCE: Bi-Annual Survey of Employment and Earnings. Central Statistical Office.

2. According to Papola and Bharadwaj (op.cit p.77), the conclusions drawn by Reynolds and Taft may be valid in the long term but could hardly explain the evolution of the wage structure in the short term. They add that in industrialised and industrialising countries "cyclical rather than secular movements seem to characterise the wage structure" (op.cit. p.75). Thus in Mauritius changes in wages would appear to be highly correlated with changes in sugar proceeds and/or the cost of living. (See Table 12 and figure 1).

T A B L E 1 7 : Analysis of Data Regarding Average Monthly and Daily Earnings Rates 1966-75

Year	(a) Monthly Paid								(b) Daily Paid							
	A.M. (Rs)	Med. (Rs)	S.D. (Rs)	Coeff. of Variation	Coeff. of Skewness	Maximum (Rs)	Minimum (Rs)	Range (Rs)	A.M. (Rs)	Med. (Rs)	S.D. (Rs)	Coeff. of Variation	Coeff. of Skewness	Maximum (Rs)	Minimum (Rs)	Range (Rs)
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1966	361.15	353.14	127.10	35.19	0.19	673.71	114.88	558.83	5.85	5.82	1.79	30.60	0.05	12.79	3.13	9.66
1967	367.80	345.41	130.68	35.53	0.51	691.15	95.19	595.96	5.88	5.93	1.80	30.61	-0.08	12.66	3.25	9.41
1968	383.86	376.62	131.49	34.25	0.17	707.37	113.74	593.63	5.93	6.16	1.77	29.85	-0.39	13.17	3.15	10.02
1969	387.91	345.32	134.22	34.60	0.95	728.81	106.06	622.75	6.20	6.21	1.75	28.23	-0.02	12.68	3.47	9.21
1970	402.17	361.78	144.44	35.92	0.84	797.61	120.33	677.28	6.46	6.08	2.15	33.28	0.53	15.82	3.62	12.20
1971	406.86	381.77	148.48	36.49	0.51	816.21	194.14	622.07	6.35	6.02	1.83	28.82	0.54	12.43	3.52	8.91
1972	429.82	399.03	150.10	34.92	0.62	912.91	237.87	675.04	7.12	6.98	2.34	32.87	0.18	15.65	3.84	11.81
1973	470.53	449.91	155.42	33.03	0.40	944.04	210.03	734.01	7.05	7.03	2.21	31.35	0.03	15.90	3.23	12.67
1974	588.11	538.52	211.23	35.92	0.70	1116.68	260.00	856.68	8.95	8.26	3.53	39.44	0.59	22.49	4.26	18.23
1975	686.89	674.00	233.81	34.04	0.17	1322.99	289.05	1033.94	10.95	10.35	3.78	34.52	0.48	25.00	5.54	19.46

A.M. = Simple arithmetic mean of the rates of earnings, unweighted by the number of employees in each sector

Med. = Median of monthly rates and daily rates

S.D. = Standard Deviation, the measure of the absolute dispersion of earnings expressed in rupees

Coefficient of variation : The measure of the relative dispersion of earnings, expressed in percentages

These figures are compiled from the Central Statistical Office: Bi-Annual Survey of Employment and Earnings in Large Establishments.

for daily rates, except for 1970 and 1971 (Col. 2(b)). The value of the coefficient of standard deviation - the measure of the absolute dispersion of earnings - increases consistently for monthly rates (Col. 4(a)); for daily rates there is no significant change until 1971 and a rapid increase afterwards (Col. 3(b)). The coefficient of variation of monthly rates, which measures the relative dispersion of these rates, keeps within a narrow range throughout the period without a definite trend (Col. 4(a)). There are more fluctuations in the value of the coefficient of variation of the daily rates of earnings with an increasing tendency towards the end of the period (Col. 4(b)).

In order to examine the evolution of average earnings in Mauritius in the light of the postulated relationship between the magnitude of changes in the wage level, the price level and wage structure (hypothesis (iii)), we may divide the period 1966 to 1975 into two parts: 1966 to 1970 and 1971 to 1975.[1] The evolution of the earnings structure in Mauritius would appear to conform to this hypothesis: a very moderate increase in the consumer price index and in the monthly and daily rates of earnings between 1966 and 1970, was associated with little change in the absolute wage differentials and stable or slightly declining relative differentials. A rapid increase in prices and in the average level of earnings after 1971, led to a sharp rise in the absolute differentials and a very small increase in the relative differentials. These results conform to Papola and Bharadwaj's observations.

Table 18/...

1. Between 1966 and 1970, the consumer price index increased by 13.2%, it rose by 77.7% between 1970 and 1975.

TABLE 18 : Analysis of Monthly and Daily Rates of Earnings (1966-75) (Deflated Data)

Year	Monthly Paid			Daily Paid		
	A.M.	S.D.	Coeff. of Variation	A.M.	S.D.	Coeff. of Variation
1966	361.15	127.10	35.19	5.85	1.79	30.60
1967	361.34	128.25	35.49	5.78	1.75	30.28
1968	363.37	124.78	34.34	5.44	1.64	30.15
1969	347.98	120.36	34.59	5.56	1.58	28.42
1970	357.95	127.63	35.66	5.71	1.90	33.27
1971	358.10	130.65	36.48	5.59	1.62	28.98
1972	359.12	125.36	34.91	5.95	1.96	32.94
1973	346.51	114.35	33.00	5.19	1.62	31.21
1974	335.29	120.44	35.92	5.09	2.03	39.88
1975	341.54	116.25	34.04	5.45	1.87	34.31

In Table 18, we have deflated the average earnings of monthly-rated and daily-rated workers by the cost-of-living index, with 1966 as base. This might give a better indication of the changes in the absolute dispersion of earnings - i.e. in the absolute wage structure - during a period of rapid inflation and escalating wages and provides another test of hypothesis (iii)[1]

According to these figures, and contrary to hypothesis (iii), the absolute differentials in real earnings of monthly-paid workers declined between 1966 and 1975 - and especially between 1970 and 1975. As regards daily earnings, the figures show a declining trend between 1966 and 1970; and a rising tendency between 1970 and 1975, with sharp year-to-year fluctuations.

It is interesting to compare the evolution of the earnings structure in Mauritius in this respect with that of other industrialising and industrialised countries. Papola and

Bharadwaj/....

1. See above page 153.

Bharadwaj studied the evolution of wage differentials in manufacturing industries in seventeen countries including nine developing countries between 1948 and 1965.[1] Changes in the wage structure of these countries are measured by means of the coefficient of standard deviation and the coefficient of variation, which provide a measure of the absolute and relative earnings differentials respectively.

In spite of the collection of countries covered by Papola and Bharadwaj, the findings may be relevant to our own study of the evolution of the Island wage structure for the following reasons:

(1) The data studied by Papola and Bharadwaj relate in most cases to the period 1955 to 1965 while our analysis covers the following decade: 1966 to 1975. The periods covered are close enough to be comparable.

(2) The rate of increase in earnings in many of these countries was of the same order of magnitude as in Mauritius.

(3) Problems faced by countries like Ghana, Kenya, India, and possibly Mexico and Taiwan with regard to their urban labour force are fairly similar to those of Mauritius: a rapid increase in wages in the "modern" urban sector with growing urban unemployment and a rapid growth of public sector employment.[2]

Papola/...

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1. The data used by Papola and Bharadwaj are the average of the gross money earnings (the two terms, wages and earnings have been used interchangeably in their analysis). These data relate to the manufacturing industries in the two-digit International Standard Industrial Classification of Economic Activities in the ILO Year Book of Labour Statistics. These industries are classified into nineteen separate groups. Our analysis of earnings in Mauritius covers all the large establishments and includes agriculture, construction, trade, transport and services, besides the manufacturing industries proper. The agricultural sector comprises five industries, the manufacturing sector twenty-one. (Footnote continued next page).

Papola and Bharadwaj found that developed and developing countries on the whole showed a widening of their inter-industry wage differentials between 1948 and 1960, whereas the planned economies of Poland, Hungary and East Germany, showed a contraction of their wage structure. Among newly industrialised countries India, Burma, Taiwan and Egypt showed an overall contraction of their wage structure.[3] On the other hand, there has been a general narrowing of relative wage differentials between 1960 and 1965 in most developed and developing countries - only one country, Kenya, has seen a substantial rise in the relative differentials during that time.

The changes in average earnings and absolute and relative differentials between 1955, 1960 and 1965 in Sweden, the United States, United Kingdom and four developing countries: India, Egypt, Kenya and Costa Rica are given in index form in Table 19. The Table shows similar data for Mauritius for the period 1965 and 1975.

TABLE 19/...

(continued.)

1. (Of these 14 industries are common to Papola and Bharadwaj and our own classification), construction 1, trade and transport 4 each and services 5. The total number of industries included in our sample is 41.
2. See below page 186 'et seq'.
3. These trends are based on the value of the coefficient of variation in the initial and terminal years; while short term tendencies are often different from longer-term ones.

T A B L E 1 9 : Index of Average Earnings, Absolute and Relative Differentials

(1955 = 100)	1960			1965		
	A.M.	Abso. Disp.	Rel. Disp.	A.M.	Abso. Disp.	Rel. Disp.
Sweden	135.3	119.9	88.6	207.2	198.1	95.6
United States	119.9	127.1	106.0	137.6	142.9	103.8
United Kingdom	133.2	189.3	132.5	179.1	252.4	140.9
Costa Rica	144.5	145.4	100.6	194.7	219.0	112.5
Egypt	106.7	64.9	60.8	126.0	57.8	45.9
India	116.1	94.5	81.4	128.8	69.5	54.0
Kenya	135.1	188.4	139.4	210.2	490.1	233.1
(1965 = 100)	1970			1975		
	A.M.	Abso. Disp.	Rel. Disp.	A.M.	Abso. Disp.	Rel. Disp.
Mauritius (Monthly rated)	111.4	113.6	102.1	190.2	184.0	96.7
(Daily rated)	110.4	120.1	108.8	187.2	211.2	112.8

SOURCE: Central Statistical Office Bi-Annual Survey of Employment and Earnings in Large Establishments.

The evolution of the earnings structure in Mauritius between 1965, 1970 and 1975 reflects to a certain extent the general tendency observed by Papola and Baradwaj. Changes in the absolute differentials followed closely the changes in average earnings with a moderate rate of increase between 1965 and 1970, and a much more rapid increase between 1970 and 1975, following the increase in average earnings which occurred after 1970. While the increase in the absolute differentials matched closely the increase in

wages/...

wages or earnings and the wage structure expanded rapidly - in absolute terms - following the rapid increase in average earnings, the relative differentials rose much more slowly, or even declined, in the case of monthly rated workers between 1966 and 1975. Thus the wage structure remained stable - in relative terms - in spite of the rapid escalation of wages in the island.

In Mauritius, as in other countries, there is a high correlation between the wage and price movements,[1] the increase in monthly and daily rates reflecting closely the increase in price level. Thus the rate of change in price level, the rate of inflation, may explain to some extent the changes in the wage level and wage structure. On the other hand, the rate of increase in absolute and relative differentials[2] may also depend on the influence of institutional forces: trade unions and Government. Trade unions tend to favour the preservation of "established relativities" while Government wage regulations generally result in a higher percentage increase in lower wage industries, which have a larger proportion of the labour force in the bottom income groups, than in the higher wage industries. In that case the influence of unions would be reflected in an expansion of the wage structure (absolute differentials increasing faster than average earnings) and state regulation in a stabilisation or contraction of the wage structure. For reasons given elsewhere, it is expected that labour organisations will have a greater influence over wage movements in developed than in developing countries, where Government minimum wage regulations tend to play a leading part in the evolution of the wage

structure/....

1. See above page 125, Table 12.
2. For a definition of these terms see above page 152, footnote 3.

structure. Sometimes Government intervention may bring about an actual reduction in absolute differentials as in the case of India or Egypt between 1955 and 1965. Elsewhere, (as in Mexico, Taiwan, Ghana and Mauritius), it may lead to a stabilisation or reduction of the relative differentials and a contraction of the wage structure, in spite of a very rapid increase in the wage level.

Compared to the seventeen countries analysed by Papola and Bharadwaj, the dispersion of earnings is very high in Mauritius. The coefficients of variation of monthly and daily earnings in the Island between 1966 and 1975 averaged 34.99 and 31.96 respectively and in that respect Mauritius was surpassed only by Ghana in 1960 and Ghana and Kenya in 1965. If Mauritius is added to Papola and Bharadwaj's list of countries, it would rank third highest after Ghana and Kenya.[1] The wage structure in Mauritius can be compared with that of Jamaica, which is another country with a highly distorted wage structure, where inter-sectoral wage differentials are also very high.[2]

Another measure of the dispersion of earnings is given by the coefficient of skewness. The coefficient is positive throughout for monthly paid workers and both negative and positive for daily-paid. The higher the value of the coefficient the greater is the difference between the mean and median values of the

distribution./....

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1. As the period covered by Papola and Bharadwaj (1948 or 1955 - 1965) differs from our own, many other countries may have seen an expansion of their wage structure in the following decade, 1966-1975, with an acceleration of the rate of inflation.
2. G Tidrick: Wage Spillover and Unemployment in a Wage-gap Economy. The Jamaican Case: in Economic Development and Cultural Change, Vol.23, No.2, July 1975.

distribution. When the coefficient is positive the median is lower than the mean; in that case the majority of rates paid are below the average, which means in effect that the majority of industries are paying their workers less than the average overall rate.[1] A negative measure of skewness means that the rates paid in the majority of cases exceed the average. This happened in the case of daily paid workers between 1967 and 1969. An interpretation of these results could be that before the general and uniform wage increases "across the board" which were granted to all wage-regulated sectors after 1971, and the rapid increase in earnings that followed, the average rate of earnings of daily paid labour was relatively low and many firms were paying their workers more than the average. Government wage policy after 1970 led to a rapid increase in average earnings particularly for low-wage (daily-paid) labour. As a result the position was reversed and the rates paid by most industries were lower than the average.

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In our search for evidence of a systematic pattern in the evolution of earnings in Mauritius, such as could result from the presence of an effective wage transmission mechanism, useful information may also be obtained by considering the changes in the ranking of industries in terms of earnings, as indicated

by the/....

1. The mean rate is the simple arithmetic average of the rates of earnings in different sectors, unweighted by the number of employees in each sector.

by the coefficient of correlation between the industries' ranks at selected points of time.[1] As said on page 112 above, in a situation where wages in individual industries are determined primarily by internal factors and uninfluenced by what takes place in other sectors, we would expect many changes in the wage distribution of industries over time. On the other hand, in the presence of a powerful wage transfer mechanism, the distribution of industries will remain relatively unaltered. The rank correlation of industries by earnings in the case of both monthly- and daily- paid workers is given in Table 20.

T A B L E 2 0 : Rank Correlation of Industries by Earnings

$R^{(1)}_{1966, 70}$	= .763	$R^{(2)}_{1966, 70}$	= .595
$R^{(1)}_{1966, 75}$	= .71	$R^{(2)}_{1966, 75}$	= .656
$R^{(1)}_{1970, 75}$	= .767	$R^{(2)}_{1970, 75}$	= .663

No of observations = 38

(1) refers to monthly earnings
(2) refers to daily earnings.

We have also compiled an index of changes in monthly and daily earnings with 1966 as base year, from which we have calculated the correlation between the rate of increase earnings in various industries for 1969, 1972 and 1975. Whereas the value of the correlation coefficient is not significant between 1966 and 1969, and 1969 and 1972, for both monthly and daily rated workers, it becomes very highly significant between 1972 and 1975.

TABLE 21/...

1. T S Papola and V P Bharadwaj, op.cit. p.83.

T A B L E 2 1 : Correlation of Increase in Earnings in Different Industries

Correlation Coefficient	Monthly Rates	Daily Rates
69,72	0.27	0.27
69,75	0.31	0.26
72,75	0.87	0.70

In other words there was no apparent pattern in the evolution of earnings between 1966, 1969 and 1972. Increases in earnings were randomly distributed between industries; some industries were lagging in 1969 and leading in 1972 (ie. Tailoring and Shirt-making and Miscellaneous Manufacturing); other industries that were leading in the pace of wage advance in 1969, showed little further increase between 1969 and 1972.

On the other hand, there is a strong correlation between industries with regard to the evolution of earnings after 1972. A fundamental change thus appears to have taken place in the evolution of wages after 1972, which accords with the changes in Government labour policy. Before 1971, Government interventions in the labour market were more specific; wages were generally fixed on an "ad hoc" basis according to the circumstances of individual industries with little consistency or uniformity between different industries. After 1971 Government wage policy took the form of a rapid succession of wage increases applying indiscriminately to all the wage-regulated sectors, including the public sector.[1]

There is/....

1. See above pages 131 - 133.

There is no evidence, from these results, of a systematic pattern in the evolution of wages before 1971, to substantiate Meade's hypothesis regarding the alleged strong influence of the sugar industry on the level of wages in the Island.[1] After 1971, however, the change in Government policy would appear to have had a much stronger influence on the evolution of wages in the Island.

The Conditions in Individual Industries

The wage structure may give rise to a systematic relationship[2] which may influence to some extent the rate of change in earnings in individual industries. This may explain the attempts by economists to link the evolution of the wage structure to the rate of industrialisation, the rate of unionisation or the degree of Government intervention. The preceding analysis has shown that the movement of earnings in Mauritius reflects to some extent the general pattern observed in other countries. But behind these general considerations, there are specific conditions which may influence to an important extent the evolution of wages in individual industries.

Before we conclude this section we should like to comment briefly on the situation in particular industries notably construction, docks and stevedoring and tailoring and shirt-making. Table 22 shows the industries with the highest and lowest average earnings between 1966 and 1975. With regard to the monthly rates of earnings, compounding of spirits and cigarette

Table 22 /....

1. On the other hand it should be pointed out that during the years 1966-1971, there was only a marginal (5%) increase in wages in the sugar industry.
2. The words 'systematic relationship' in this context refer to the pressures which an increase in wages in one sector may exert towards an increase in other sectors; see above p.113.

T A B L E 2 2 : Highest and Lowest Average Earnings in Mauritius - 1966-75

Year	Monthly Paid			Daily Paid		
	Highest	Lowest	Range	Highest	Lowest	Range
1966	673.71 (Com. of spirits)	114.88 (Tailoring & Shirt-making)	558.83	12.79 (Docks)	3.13 (Mining & quarrying)	9.66
1967	691.15 (Com. of spirits)	95.19 (Tailoring & Shirt-making)	595.96	12.66 (Docks)	3.25 (Private Health)	9.41
1968	707.37 (Com.of spirits)	113.74 (Tailoring & Shirt-making)	593.63	13.17 (Docks)	3.15 (Rest. and Hotels)	10.02
1969	728.81 (Com. of spirits)	106.06 (Tailoring & Shirt-making	622.75	12.68 (Docks)	3.47 (Tailoring & Shirt-making)	9.21
1970	797.61 (Com.of spirits)	120.33 (Tailoring & Shirt-making)	677.28	15.82 (Docks)	3.62 (Tobacco)	12.20
1971	816.21 (Com.of spirits)	194.14 (Private Health)	622.07	12.43 (Other Agric)	3.52 (Tobacco)	8.91
1972	912.91 (Com.of spirits)	237.87 (Hotels & REst.)	675.04	15.65 (Docks)	3.84 (Tailoring)	11.81
1973	944.04 (Com.of spirits)	210.03 (Private Health)	734.01	15.90 (Docks)	3.23 (Tailoring)	12.67
1974	1116.68 (Com. of spirits)	260.00 (Food and Bread)	856.68	22.49 (Docks)	4.26 (Tailoring)	18.23
1975	1322.99 (Com. of spirits)	289.05 (Food and Bread)	1033.94	25.00 (Docks)	5.54 (Repairs of Elec.	19.46

SOURCE: Compiled from Central Statistical Office Bi-Annual Survey of Employment and Earnings in Large Establishments.

manufacture have led consistently throughout the period; for daily rates docks and stevedoring have led in every year except 1971.[1] The laggards have been tailoring and shirt-making until 1970, in the monthly paid category and private health, hotels and restaurants and food and bread afterwards. In the daily-paid category we find among the industries with the lowest rates of earnings, a miscellaneous collection which comprises tailoring and shirt-making which trailed behind on four occasions, private health, hotels and restaurants, quarrying and tobacco.

Construction

Although it does not figure as a leader in any year, construction came second- or third since 1970 with regard to rates of earnings of daily-paid workers. The industry benefited to an important extent from the general prosperity and rapid increase in the level of economic activity and rate of investment after 1970. Between 1971 and 1975 output (value added) of construction industry went up by 33% and employment increased from 2525 to 6034.[2] Wages of carpenters, masons and painters rose rapidly and, under the pressure of demand, the price paid for an experienced carpenter or mason was often twice the stipulated rate. This is reflected in the rates of earnings in the construction industry which were far in excess of the average rates paid in manufacturing industries for both categories of workers; average earnings of monthly paid and

daily/...

1. In 1971, there were repeated and prolonged strikes at the docks. The rate of earnings are calculated on the average of wages paid on the last Thursday in March and September. Disturbed labour conditions may account for the unusually low rate of earnings for the Docks that year.
2. Mauritius Economic Review 1975-77, p.32. Table 5-2. These figures refer to employment in large establishments only.

daily paid workers in construction exceeded the average monthly and daily earnings in manufacturing industries by 66% and 47% respectively.

Docks and Stevedoring

The docks are a long way ahead of other sectors with regard to the rate of earnings of daily-paid workers. The average daily rate at the docks in every year except 1971, was more than double the rates in other industries. This is explained partly by the strategic position of the docks with their virtual monopoly of inward and outward cargo-handling, a closed-shop system of labour organisation[1] and a long tradition of labour militancy. Dockers are a most vocal group and through their leaders have always weilded much political power. The most strike-prone sector of the labour market, docks comprise an extensive system of lighterage and warehouses which are still privately owned. The docks are the only important sector where wages and conditions of employment are still determined by collective bargaining.[2]

Tailoring and Shirt-making

To explain the low position of this industry in the earnings table we need to study its evolution between 1966 and 1975. The table below reveals the fundamental transformation of the industry during that decade, from a small scale and traditional "backroom" enterprise catering for the local market into a modern industry producing essentially for export markets in a

highly/...

1. See P Hein: op.cit. Ch 1, page 40.

2. With the opening of the Bulk Sugar Terminal in 1980, the Docks were closed and most of the staff and workers were "pensioned off".

highly competitive field. As the number of establishments increased rapidly from five in 1966 to thirty-four in 1975 following the creation of the Export Processing Zone, employment grew apace and the structure of the industry was profoundly modified. This is shown by the change in the ratio of monthly-paid to daily-paid workers; it also appears in the percentage of male to female workers in the labour force.

A study of the earnings in the tailoring and shirt-making industry reveals the following facts:

T A B L E 2 3 : Tailoring and Shirt-making: Number of Firms, Employment and Average Earnings: 1966-1975

(1966 = 100)

Year	No of firms	No of Employees		Ave. Earnings (Rs)		Percentage	
		Monthly*	Daily*	Monthly	Daily	Monthly	Daily
1966	5	77	72	114.88	4.75	100	100
1967	6	110	85	95.19	5.08	82.9	106.9
1968	6	111	114	113.74	5.37	99.0	113.1
1969	7	129	152	106.06	3.47	92.3	73.1
1970	8	133	248	120.33	3.72	104.74	78.3
1971	16	181	713	245.74	4.41	213.9	92.8
1972	21	311	1455	281.34	3.84	244.9	80.8
1973	28	480	2981	353.30	3.23	307.5	68.0
1974	34	761	5268	408.73	4.26	355.8	89.7
1975	37	976	6291	459.33	6.69	399.8	140.8

* Average of March and September figures for both monthly and daily-paid.

SOURCE: Central Statistical Office: Bi-Annual Survey of Employment and Earnings in Large Establishments.

The average earnings of monthly and daily-paid workers is substantially lower than the average for the whole manufacturing sector. In terms of earnings it would rank in the last quartile

of industries/...

of industries and, in that respect, Mauritius is not different from other countries where the textile sector is characteristically a low-wage one, belonging to the third or fourth quartile of industries in the Papola and Bharadwaj classification.[1] The only exception is India where textiles occupy a leading position.

In Mauritius these low earnings can be explained by the following factors: firstly, in a rapidly expanding industry, a large part of the labour force was undergoing training and their earnings were naturally below those of mature experienced workers; secondly the new industries in the Export Processing Zone employed a high percentage of female labour; there is a substantial difference in the rates of pay of male and female workers. Thirdly, these industries were exempted from the stipulation of the minimum wage regulation.

Another interesting feature of the textile industry is the striking difference in the evolution of monthly and daily rates of earnings over the period. After remaining fairly stable between 1966 and 1969, the monthly rate began to rise rapidly; this made tailoring and shirt-making thesector with the fastest rate of increase in earnings for that category of workers. Exactly the opposite took place in the case of daily-paid workers, whose earnings remained fairly stable until 1971 and then dropped to 89.7% of the 1966 rate in 1974; the daily rates however recovered in 1975 to 140.8% of the 1966 figure. The substantial decline in the average earnings of daily paid workers made tailoring and shirt-making an extreme laggard in the pace of wage advance, as far as the earnings of daily-paid

workers/....

1. T S Papola and V P Bharadwaj: op.cit. p.88 Table 5.

workers was concerned. This divergent movement in earnings of monthly- and daily-paid workers resulted in a considerable widening of the differential between monthly-paid (skilled) and daily-paid (unskilled) workers. While the average earnings of both categories of workers were very close in 1966,[1] by 1975 earnings of daily-rated workers were on average only 38% of those of the monthly-paid.

This could provide an interesting example of the operation of market forces in a young industry subject neither to appreciable union organisation nor to minimum wage regulation. It may be interesting to refer in this connection to the case of the men's shirt industry in Puerto Rico. In broadly similar circumstances - a fourfold increase in employment in a rapidly expanding export industry - a widening gap developed between the hourly earnings of sewing machine operators (skilled workers) which rose by 77 per cent between 1951 and 1956 whereas labourers and other low-skilled occupations had wage increases of only 5 to 14 per cent over the same period.[2]

Conclusion

From the analysis of the changes in earnings in different sectors it would appear that the experience of Mauritius is broadly similar to that of other developing countries in this regard and conforms to the second and third hypotheses mentioned by Papola and Bharadwaj: a rapid increase in absolute differentials, almost proportionately to the increase in the average level of earnings, while the relative differentials

have/....

1. In fact daily-paid workers had a slight edge on the monthly-paid workers in 1966.
2. L G Reynolds and P Gregory: op.cit. Ch 2, pp.76 and 77.

have remained fairly stable throughout the period.

What do these results tell us regarding the influence of institutional forces - trade unions and Government - on the Island wage structure? We have seen above, and it is an assumption which underlies most of the institutionalist theories of wage determination, that a high degree of intersectoral wage interdependency is generally associated with the effective unionisation of the labour force.[1] If there is a strong wage transfer mechanism between different sectors we would expect a close association between the movement of wages (or earnings) in those sectors. We have seen that the changes in the rates of earnings in the sugar industry - the postulated wage leader in the Mauritius labour market - had some influence on the rates of earnings in other sectors except Government.[2] Besides in the presence of strong unions, we would expect the inter-industrial earnings structure - i.e. the ranking of industries with regard to earnings - to remain fairly stable over time. This does not appear to have been the case in Mauritius, where a rank correlation of the monthly and daily rate of earnings in different industries for 1966, 1970 and 1975, gave the following results:

TABLE 24/...

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1. Robert J Flanagan: Wage Interdependence in Unionised Labour Markets: op.cit. pp.636-638, and C Mulvey & J A Trevithick: op.cit. p.2.
2. See above pp:131-133

T A B L E 2 4 : Ranking Order of Industries

$R^{(1)}$	70, 75	= 0.79	n = 41
$R^{(2)}$	70, 75	= 0.62	
$R^{(1)}$	66, 70	= 0.76	
$R^{(2)}$	66, 70	= 0.60	
$R^{(1)}$	70, 75	= 0.77	n = 38
$R^{(2)}$	70, 75	= 0.66	
$R^{(1)}$	66, 75	= 0.71	
$R^{(2)}$	66, 75	= 0.66	

(1) Monthly rated labour
(2) Daily rated labour
n = number of observations

These results show a fairly high degree of flexibility (or pliability) in the ranking of industries with regard to both monthly and daily-rated earnings between 1966, 1970 and 1975. They do not conform to what could be expected from the presence of strong effective unions in the Island labour market. Thus the available evidence does not support the view that unions have played a dominant role in the evolution of the wage structure in the Island between 1966 and 1975.

In fact ever since the establishment of Wages Councils in the sugar industry in 1963, unions would appear to have played a secondary, subdued role and Government has assumed almost complete responsibility in wage matters in the regulated sectors of the labour market.

With regard to the part played by Government, we have seen above that the minimum wage legislation may have been instrumental in boosting the wages of the daily-rated labour who

comprise/...

comprise most of the unskilled labour force.[1] Government may also have been effective in controlling the expansion of the (relative) wage structure through its policy of granting lower percentage increases to higher-paid workers as compared with the lower-paid ones. The cost of living allowances (COLA) were based on a graduated scale and subject to a specific ceiling.[2] Finally the results show a much higher correlation of intersectoral increases in earnings between 1972 and 1975 than for previous years,[3] as a result of the succession of uniform wage increases granted by Government to all the wage-regulated sectors.

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Government Labour Policy in a Wage-Gap Economy

In the preceding section we have analysed the evolution of the Island wage structure through a decade of rapid wage increases. The objective was to assess the influence of institutional forces in the process of wage determination and investigate the importance of the sugar industry as a wage leader in the Island labour market. We now proceed to an analysis of the influence of structural forces in the labour market and the implication for Government labour policy.

In this section we shall examine the institutional environment and the effect of structural forces operating within that environment. These structural forces play an important part in determining the allocation of resources in plantation economies.[4] We shall investigate in this connection some of the "puzzling features"

of the/...

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1. See above page 157.
2. See above page 138.
3. See above page 168.
4. See Chapter 1, pages 27 and 28; and pages 196-213 below.

of the wage and employment situation in Mauritius and the effect of a rigid and distorted wage structure on the allocation of labour in the Island.

The section will be divided into two parts: In the first part, we shall outline the influence of the plantation system on the labour market. This section we shall call the Beckford scenario. The other section will deal with the wage-gap hypothesis and the role of Government.

The Beckford Scenario

In his book "Persistent Poverty", G L Beckford argues that underdevelopment is a dynamic process in the sense that there are systematic forces which operate in the direction of keeping underdeveloped economies continuously underdeveloped; the dynamics of underdevelopment in the plantation society inhere in the institutional environment:

(i) The plantation is a creation of metropolitan Europe and an extension of the metropolitan economy.[1] It provided historically the necessary organisation for the introduction of European capital, enterprise and technology to work with a large imported unskilled and "servile" labour force in the production of export crops for the metropolitan market. Today the plantation has become deeply rooted in the environment of developing countries and "to shake it may well threaten the entire social and economic order."[2]

(ii)/...

1. See above Chapter 2, pp 59 and 62.
2. G L Beckford: Op.cit. Ch 1, p.5.

(ii) The peasant sector is an important subsector within the general framework of the plantation. It competes with the plantation for land and other resources and provides wage labour for work on the plantation. The plantation has a debilitating influence on the peasant economy. It appropriates land and other resources as a means of control over the supply of labour and thus effectively constrains the development of the peasant economy. The debilitating effect of plantations on the rest of the economy is compounded by rapid population growth. The growing population pressure in the (informal) rural sector by "expelling" people from that sector will accelerate the rate of internal migration; for the land market can play a central role in the migration decision.[1] In most plantation economies it is common to find a highly concentrated pattern of land ownership within the plantation sector and excessive land fragmentation in the informal rural sector. In these conditions a high rate of population growth might be expected to accelerate the rate of internal migration.

(iii) The institutional legacy of the plantation resides essentially in a coercive labour system. The problem from the very beginning was how to secure an adequate labour supply for plantation work. Slavery and indentures historically provided the necessary organisation.[2] The engrossment of land by the plantation has given rise to a large agricultural proletariat.

(iv)/....

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1. N Stern: On Labour Markets in Less Developed Countries prepared for the Dev. Research Centre of World Bank (Mimeo. §2 p.13.

2. See above Chapter 2, pages 63 and 64.

(iv) The institutional constraints on resource use inherent in the plantation system result in the underutilisation of land, labour and capital in these societies.[1] The existence of unemployment and under-employment is a reflection of the poor distribution of labour in an agricultural system in which rush seasons alternate with long periods of idleness and which provides only a limited number of work-days during the year.[2] The system ensures that the supply of resources is structurally mal-adjusted to the demand for it; it perpetuates what Beck-ford calls a "fractured" resource situation: labour and entrepreneurship are "bottled up" within the peasant sec-tor, while land and capital are monopolised by the plantation sector.[3]

(v) The comparatively low productivity among peasants in the plantation economies is due to the scarcity of complemen-tary resources, which result from the monopolisation of land and capital resources by the plantations and excess-ive product and factor price distortion. The dynamic sector for growth (the peasant sector) is constrained by the plantation sector which contributes more to growth elsewhere. The entranched position of the plantation sector leads to its over-development and the consequent underdevelopment of the peasant economy. Beckford adds that the comparative institutional disadvantages of the peasant sector vis-à-vis the plantation are aggravated by the expansion of urban and semi-urban employment which

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1. See below p.184 footnote 3.
2. For evidence of this in the case of Mauritius, see R W Luce: Report to the Government of Mauritius on Employment, Unemployment and Underemployment in the Colony in 1958. Port Louis 1958, Chapter 2, page 3. See also Chapter 1,pp.27/28
3. G L Beckford: op.cit. Ch 6, p.179.

draw labour away from the peasant sector to better paid, more regular or less stringent employment in the towns.

(vi) Institutional factors play an important part in determining the pattern of production and resource use in plantation economies. For in a situation where "resources are not fully employed and where a perfectly competitive system does not exist there will be product and factor price distortions which complicate the calculus. In all plantation situations these distortions are likely to be quite excessive."[1]/ According to Beckford, the social costs of plantations is equal to the divergence between private and social values, which results from imperfections in the product and factor markets and the high degree of specificity of fixed capital inputs within the system.

These distortions are well in evidence in cane sugar industry. It is a highly capital-intensive vertically integrated enterprise with strong linkages between field and factory. Limitations in product and factor substitutability inhere in the system. The allocation of resources in the economy is further constrained by structural rigidities and vested interests - which are another source of divergence between private and social values. This leads to the under-utilisation of land and unemployment on the one hand and a general tendency towards mechanisation of field operations on the other. Growing mechanisation in societies with high unemployment

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1. G L Beckford: op.cit. Ch 6, p.156

According to Beckford development possibilities in all countries are determined chiefly by institutional factors that ultimately influence the more proximate growth variables such as resources,capital accumulation, technological change and human capital. G L Beckford, Ch 7, p.183.

are an expression of the divergences between private and social values which characterise the plantation economies.

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We shall now consider certain implications of the Beckford model which are especially relevant - in our opinion - to the study of Government labour policy in plantation economies, namely:

(i) resource under-utilisation, underemployment and low productivity in the informal sector, and

(ii) wage distortions in the labour market.

Beckford attributes the under-utilisation of labour to the monopolisation of land and capital by the plantations. The existence of unemployment and underemployment, he argues, is a reflection of constraints inherent in the system, which cannot be eliminated by orthodox market price policy. After having monopolised most of the productive land and created a rural proletariat, the plantations cannot fully utilize all the available labour all the time. Rush periods alternate with periods of idleness. This leads to the casualisation of the labour force and seasonal unemployment. These distortions are compounded by rapid population growth, as a result of which an increasing number of people are "bottled up" in the informal sector, depress productivity in that sector, and aggravate the income gap between the modern and informal sectors.

Beckford argues that the productivity of labour in the informal sector depends on institutional factors much more than on technological ones. "Institutional factors play an important

part/...

part in determining patterns of production and resource use in plantation economies and ... more often than not, these patterns are not representative of the best deployment of resources for the society as a whole."[1] In economic theory the principle of substitution asserts that the choice of technology depends on the relative cost of factors of production, which depends in turn on the relative availability of these factors. In the informal rural and urban sectors characterised by underemployment, labour is used profusely and indiscriminately, whereas its use is restricted on estates by chronic labour shortages and rising costs.

The plantation system thus leads to a maladjustment of the supply of resources to the demand for them, under-utilisation of land and underemployment or unemployment. "No policies to restrain population growth and to introduce appropriate technology can deal with this situation."[2] The under-utilisation of the growing labour force is due to the fact that the bulk of the people have little or no access to the necessary co-operant resources.[3] In these conditions, measures taken to

increase/...

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1. G L Beckford: Op.cit. Ch 6, p.154.
2. G L Beckford: Op.cit. Ch 6, p.179.
3. There is no presumption that improvements of labour allocation is more likely to result from improvements in the labour market than from improvements in other factor markets. (A Berry & R H Sabot: Labour Market Performance.etc: Op.cit. p.1227. The same point is made by J and L Crusol.(a) They argue that the system of land ownership in island plantation economies has created two serious distortions. On the small farm, the relative scarcity of land and the abundance of family labour have resulted in an overutilisation of labour and a relatively low output per individual. Likewise the insufficiency of these farms and limited financial and technical resources have led to their under capitalisation. On large estates, the relative abundance of land has encouraged its waste,

   (a) J and L Crusol: A Programme for Agriculture in Island Plantation Economies. World Development, Vol.18, No.12, pp. 1027 - 1033.

increase employment and wages in the plantation sector or modern urban sector may further aggravate the relative disadvantages of the informal rural and urban sectors. "Labourers faced with the competing alternatives of rural-small-farm, estate and urban employment shift away from the former towards better paid or more regular employment."[4] In Mauritius for instance small cane planters have been facing increasing difficulties in their labour supply as employment conditions were improved on estates and in the modern urban sector.[5] Likewise an increase in wages or employment in the Government sector by increasing the reserve price of estate labour and the rate of rural-urban migration may aggravate labour shortages in that sector.[6]

A Paradoxical/...

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while the availability of low-paid manpower has reduced the incentive to increase the level of agricultural technology and capitalisation.

Under these circumstances the small farmer over-utilises his most abundant resource, labour, whereas the large farmer does the same with his land. Since the productivity of labour is low on small farms, the large estates can maintain low wage levels, which allow them to function at a lower level of efficiency and with less capital than would be necessary in a truly competitive situation.

To the extent that effective productivity on both large and small farms is less than that possible in a truly competitive situation, the consequence is underproduction in agriculture.

Thus the large income disparities which characterise the developing countries in general, and small plantation islands in particular, may have their roots in the high concentration of land ownership in these countries. The land-tenure system in turn is based on and forms an integral part of the social and political fabric of these societies.(b)

(b) M P Todaro: Economics for a Developing World: Ch 15, pp.230-239.

4. G L Beckford: Op.cit. Ch 1, p.26.

5. Mauritius Chamber of Agriculture: Report on the Problem of Labour Shortage in the Sugar Industry, May 1973, Ch 2, pp.8 and 9.

6. G Tidrick: Wage Spillover and Unemployment in a Wage-Gap Economy. Economic Development and Cultural Change, Vol.23, No.2, January 1975.

A Paradoxical Situation

The apparently paradoxical situation of a rapid rate of growth of output and increase in wages accompanied by an increasing level of urban unemployment has been encountered over the last two decades in many developing countries: Nigeria, Kenya, Jamaica, Zambia, Mexico, Trinidad, Ghana and Puerto Rico.[1] The growth of urban unemployment is a pressing problem with considerable social and political implications in these countries and has been the object of growing concern on the part of the authorities. Most of the measures taken to deal with the problem have involved in one way or another an increase in public sector employment and a concomitant increase in Government expenditure. Yet these measures have not resolved the problem. "Perhaps the most discouraging argument against attempting to solve the urban unemployment problem by increasing employment opportunities is the tendency for demand and supply to intereact in such a way that an increase in employment is accompanied by an increase in unemployment ... an increase in quantity demanded brings forth an increase in quantity supplied through a reduction in the flow-out of the labour force and an increase in new entrants."[2]

In his/....

1. The causes of the growing level of urban unemployment in developing countries, and continuing high rate of rural-urban migration have been studied by many economists, notably by C R Frank, Jr in Urban Unemployment and Economic Growth in Africa (Oxford Economic Papers, July 1968); M P Todaro in: A Model of Labour Migration and Urban Unemployment in Less Developed Countries (American Economic Review March 1969); J R Harris and M P Todaro in Migration, Unemployment and Development: A two-sector analysis (American Economic Review 1970); P Collier: Labour Mobility and Labour Utilisation in Developing Countries (Bulletin of Oxford University Institute of Economics and Statistics, August 1975); G S Fields in Rural-Urban Migration, Urban Unemployment and Under-Employment, and Job-Search Activity in L.D.Cs (Journal of Development Economics 2, 1975); G Tidrick in Wage Spill-over and Unemployment in a Wage-gap Economy (Econ. Development and Cultural Change, January 1975) and L G Reynolds in Wages and Employment in a Labour Surplus Economy (American Economic Review March 1965).
2. C R Frank. Urban Unemployment and Economic Growth in Africa: Op.ci

In his study of urban unemployment in Africa, Frank estimated that the African urban labour force was increasing at a mean annual rate of 6.8 per cent after the war (which far surpassed the estimated growth of the total population over the same period), while job opportunities in the non-agricultural sector were growing much more slowly. Yet these low rates of growth cannot be attributed to a low growth in output. Many African countries were experiencing a rapid rate of growth of non-agricultural output during a period of transformation and modernisation of their economy just before or after independence. Some representative annual rates of increase of non-agricultural output between 1954 and 1964 are given by Frank: Kenya 6.5%, Rhodesia 6.7% and Uganda 7.7%. Non-agricultural output in Tanzania increased at a rate of 6% between 1954 and 1958 and 9.1% between 1960 and 1964.

According to Lloyd Reynolds[1] the growth rate of total and per capita output in Puerto Rico between 1950 and 1960 has been one of the highest in the world. Real GNP per capita rose at an average of 5.2% a year during the fifties and manufacturing output tripled in real terms. Yet total employment fell during the same period. In spite of a deteriorating situation on the labour market wages rose at a startling rate. Between 1950 and 1963, the average level of earnings of manufacturing workers almost tripled.

A similar situation was found in Jamaica. Between 1953 and 1960, that country experienced a spectacular growth of output. Total output increased by 76.8 per cent, an annual rate of increase of approximately 8½ per cent and real average earnings

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1. L G Reynolds: Wages and Employment in a Labour Surplus Economy. The American Economic Review 1965, pp.21-28.

rose by about 4 per cent per annum. "Modern" non-agricultural jobs increased by an estimated 50 per cent , while the labour force increased by only 2.5 per cent due to massive emigration to the UK. Yet unemployment remained extremely high throughout; it fell only slightly from 98,000 to 88,100 during the period.

Inspired by the Lewis model of economic development in a labour-surplus situation, economists have attributed the slow rate of growth of employment in many developing countries during a period of rapid economic growth to the increasing wage trend in the modern sector due to the operation of institutional forces in the labour market.[1] From empirical data relating to different countries, they have calculated the price elasticity of demand for labour and found negative, often near-unity, coefficients of elasticity in different parts of the world.[2] These studies have sought to establish that rapid wage increases have important negative employment effects in developing countries. But increasing wages explain only part of the problem. "For whereas the rate of growth of employment in the modern sector is largely a function of wage trends, the level of unemployment is a function of the wage structure."[3] Harris and Todaro have shown that the two problems are linked because wage increases in the modern high-wage sector aggravate the income-gap between the modern and traditional sectors, while

the growth/...

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1. W M Senga: Wages, Market Imperfection and Labour Absorption in Kenya Manufacturing. Eastern African Economic Review, June 1973, Vol. 5, part 1, p.55.
2. S Watanabe: Minimum Wages in Developing Countries: Myth and Reality. International Labour Review, Vol.113 No.3 May/June 1976. See also L Reynolds and P Gregory: Wages, Productivity and Industrialisation in Puerto Rico. (The Economic Growth Centre. Yale University 1965), Ch 3, p.100.
3. G Tidrick: Op.cit. p.306.

the growth of employment in the modern sector increases the prospects of employment there, hence it increases the number of migrants into that sector.

We shall use the migration model developed by Harris and Todaro and extended by Fields, Collier, Tidrick and others for an analysis of the local labour situation with particular reference to Government wage policy and its influence on the allocation of labour in the Island.

The Harris-Todaro Model

The basic characteristics of the Harris-Todaro model:

(i) Rural-urban migration occurs primarily for economic reasons. Migrants consider the various markets available to them and choose the one which maximises their expected gain from migration.

(ii) The urban wage is rigid, i.e. inflexible downwards, and set institutionally above the market clearing level. This gives rise to a segmented labour market with an excess supply of labour and open unemployment in the urban (high wage) sector.

(iii) Migration decisions depend on expected earning differentials between the two sectors; expected earnings in turn depend on the probability of being selected from the pool of urban job-seekers, i.e. on the rate of urban unemployment if the selection is a random one.

(iv) In equilibrium rural income will be equal to the expected urban income. Thus the rate of urban unemployment is the equilibrating force in the model. Migration takes place in disequilibrium.

(v)/...

(v) Urban unemployment is voluntary in the sense that there are employment opportunities available (in the low-wage sector) which the worker declines to accept. Likewise rural-urban migration with urban unemployment is a rational decision.

Let Wu and Wa denote respectively the nominal urban and agricultural wage rates.[1] Wu is a politically determined (or institutional) wage which is set above the market clearing level. Eu is the number of urban jobs; Lu is the urban labour force. The expected urban income is:

$$p\,Wu = Wu\,(Eu/Lu) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)^2$$

Harris and Todaro assume that there is full employment in agriculture. Expected rural income p(Wa) is therefore equal to Wa. The amount of rural-urban migration ($\dot{Lu}$) is a function of the urban-rural expected wage differential.

$$\dot{Lu} = f\,(p(Wu) - (Wa)) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

The rural-urban equilibrium condition where $\dot{Lu} = 0$ is given by

$$p(Wu) = (Wa) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Since p(Wu) = Wu(Eu/Lu), the equilibrium condition can be written thus:

$$Eu/Lu = Wa/Wu \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

The ratio/....

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1. Suffix 'u' and 'a' stand for "urban" and "agricultural", respectively.
2. This assumes that the process of labour recruitment in the modern sector is a random one.

The ratio of rural to urban wage will also determine the urban unemployment rate, which could be expressed as (1 - Eu)/Lu. Harris and Todaro have shown that rural-urban migration is quite rational despite the existence of urban unemployment. The imposition of a minimum wage in a segmented labour market will thus result in an equilibrium characterised by unemployment. There will be open unemployment in such a market in equilibrium as long as a worker without a job has a higher probability of obtaining a high-wage job than a worker with a low-wage job.[1,2] In the Harris-Todaro model, the rate of urban unemployment will thus depend on:

(i) the income differential between the two sectors (Wa/Wu) and

(ii) the number of jobs in the urban sector: Eu.

In the terms of the model, Government policies designed to eliminate unemployment by generating new employment opportunities in the urban sector, without a simultaneous effort at lowering the real earnings differential between the two sectors, will aggravate the problem of urban unemployment. In the terms of equations (1) - (4) above, these measures would increase Eu, hence p(Wu) relatively to Wa and lead to an increase in the flow of migrants into the urban sector.

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1. For a diagramatic representation of the relation between migration, urban unemployment and the rural/urban wage differential, see G Tidrick: op.cit. p.310.
2. A Berry and R H Sabot: Labour Market Performance in Developing Countries. World Development, Vol.6 Number 11/12 November/December 1978, p.1217.

The Harris-Todaro model predicts rates of unemployment which are substantially higher than the observed rates. This has led economists (Johnson (1971), Fields (1975), Collier (1975)) to modify the assumptions and extend the scope of the original model. These extensions include the introduction of a new employment sector: the urban traditional, flexible-wage or "murky" sector (Fields, 1975), the inclusion of job-search parameters, which are made to depend on various cultural and institutional factors, the modern sector recruiting policy (e.g. preferential treatment of the better educated), and the rate of labour turnover.[1] Other extensions (Collier, 1975) comprise the introduction of a utility function (which will reflect the migrant's degree of risk aversion) and a perception function: migration decisions are based on perceived values and are only affected by objective values to the extent that the former are a function of the latter. With the insertion into the model of a perception function, the quality and quantity of information about job opportunities can be incorporated into the analysis.

The main objective of these refinements has been to produce models which predict much lower unemployment rates than the Harris-Todaro model; unemployment rates which accord with the rates actually observed in the urban labour market of developing countries. They have also established a number of

important/...

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1. The Harris-Todaro specification is equivalent to a situation where all jobs turnover in every period while the earlier Todaro specification (Todaro, 1968) had no job turnover at all. According to Johnson (1971) the equilibrium unemployment rate may vary directly with the rate of labour turnover. The lower the turnover rate, the lower the urban unemployment rate. On the other hand, according to J Stiglitz, in his formulation of the labour-turnover model of wage determination in L.D.Cs, the rate of labour turnover varies inversely with the rate of unemployment. See above Chapter 3 p.146 footnote 2.

important policy implications: As Fields put it: It is job hiring in the modern sector, more than the number of jobs, which primarily influence workers' location decisions ... A small increase in the number of jobs has a much larger proportional effect on job-hiring and induces substantial rural-urban migration and increases the rate of urban unemployment."[1,2]

The Tidrick Model

In his analysis of labour shortages and unemployment in Jamaica, Tidrick emphasizes the three elements which generally characterise labour markets in developing countries: rapid overall employment growth, persisting unemployment in the modern (high-wage) sector and growing labour shortages in the traditional (low-wage) sector. The Tidrick model is essentially similar to that of Harris and Todaro but Tidrick considers certain aspects of the problem (wage spillover, casualisation of the labour force and emigration) not considered by Todaro. The link between expected lifetime earnings differentials and unemployment is central to both models. The distorted wage structure and market imperfections symbolised by the wage-gap, results in a withdrawal of labour from the traditional sector and a growing excess supply of labour and unemployment in the

modern/....

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1. G S Fields: Rural-Urban Migration, Urban Unemployment and Under-Employment ... L.D.Cs: Op.cit. p.186.

2. The predicted increase in the urban unemployment rate as the number of modern sector jobs increases contrasts with Harris and Todaro's prediction that job creation would lead to more absolute unemployment but a lower unemployment rate ... According to Fields "a small increase in the number of modern sector jobs leads to a larger increase in the number of jobs for which hiring is taking place (because of the assumed low turnover-rate) and therefore to a large increase in the number of unemployed urban job-seekers. This result forms an acceleration - like process whereby small increments in the availability of modern sector jobs lead to a large increase in the rate of modern sector job hiring to which present-value-maximising migrants presumably respond ... G S Fields: Op.cit. pp.185 and 186.

modern sector. Tidrick shows that in these conditions neither emigration nor rapid employment growth in the modern sector will significantly reduce unemployment there as long as a wage-gap exists.[1]

The model contains two sectors: mining which stands for the modern sector and sugar for the traditional sector. The wage rate in the modern sector is assumed to be rigid and determined independently of the level of employment in that sector; this assumption would depict adequately the situation in the public sector in Mauritius and other countries (i.e. Ghana) where the level of employment and wage rate in the government sector would appear to be determined primarily by the taxing capacity of the country.[2] The withdrawal of labour from the traditional sector - (which Tidrick depicts diagramatically in the form of a curve[3] - and which is analogous to Todaro's concept of internal migration) is a function of the wage gap between the two sectors. In equilibrium $Ws = \frac{H}{U}Wm$ where Ws denotes the wage rate in the traditional (sugar) sector, Wm, the wage rate in the modern (mining) sector, H the number of hirings and U the level of unemployment in the modern sector. If H is constant, an increase in Wm must cause either Ws or U, or both to rise inorder to re-establish equilibrium.

Tidrick/...

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1. The Puerto Rico case studied by Reynolds and Gregory bears many striking similarities to the Jamaican situation. In both cases we find a rapid rate of growth of output in the modern (non-agricultural) sector, a slowly growing modern sector labour force, with substantial emigration and persistent heavy unemployment.
2. C R Frank: Urban Unemployment etc. op.cit. p. 256.
3. See above page 191 footnote 1.

Tidrick argues that if the probability of getting a job in the modern sector is higher if a worker is not employed in sugar, it will be rational for a new entrant to remain unemployed rather than take a job in sugar, or for a sugar worker to leave his job in order to seek a job in the modern sector, so long as (1) the present value of his foregone earnings in sugar is less than the expected life-time earnings in mining and (2) he has some means of subsistence during his period of unemployment.[1,2] In terms of the Tidrick model (1) an increase in wages in the modern sector will increase wages in the traditional sector (by withdrawing labour from that sector) and unemployment in the modern sector, (2) an increase in the rate of growth of employment in the modern sector will generally raise the level of unemployment in that sector[3] and (3) an increase in the rate of growth of the labour force will increase unemployment in the modern sector.

According to these models Government is placed on a treadmill. An increase in employment in the modern sector, including the public sector, by increasing the prospect of finding a job in that sector, will intensify the rate of urban migration. This

may/....

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1. In this connection, see N Stern: On Labour Markets in Less Developed Countries: op.cit. p.11 para.2, and A Berry and R H Sabot: Labour Market performance in Developing Countries, op.cit. p.1221.
2. The concept of a labour supply (withdrawal) curve may provide a plausible explanation for the growing labour difficulties faced by the sugar industry - especially the small cane planters - and the agricultural sector generally in Mauritius, in the face of a rapid increase in the number of urban - especially government - jobs. See below pages 198/199.
3. "If the wage elasticity of demand for labour in sugar is minus unity, the mining sector must be larger than the sugar sector before an increase in the rate of growth of mining employment will reduce urban unemployment". This is derived from the equilibrium condition $\frac{M}{S} = -\eta s$ where $\frac{M}{S}$ is the ratio of mining employment to sugar employment and $-\eta s$ is the elasticity of demand for labour in sugar. G Tidrick: Op.cit. p.314 and footnote 9.

may lead to an aggravation rather than an improvement in the urban unemployment situation; which will in turn generate more pressure on Government to accelerate the rate of job creation.

These models lead to an important conclusion: wage policy guidelines should be linked explicitly to the wage or income gap; and wage increases should be inversely proportional to the gap between the wage level in high wage and low wage sectors.[1] In these conditions guidelines that allow wage increases in proportion to the overall growth in productivity, or worse, individual industry productivity growth, will only serve to aggravate the imbalance in the labour market.

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Income Differentials and Labour Mobility in Mauritius

In the rest of this section we shall discuss the relevance of the Harris-Todaro and Tidrick models to the local situation. To recapitulate, their analysis of unemployment in a wage-gap economy contains the following elements: two well-defined sectors; a substantial wage or income gap between the two sectors; an institutionally determined urban wage and significant rate of rural-urban migration with growing urban unemployment. In our adaptation of the wage-gap hypothesis to Mauritius, the traditional (rural) sector is represented by the small cane producers while Government plays the part of the urban sector. The class of small cane producers has many of the conventional features of the traditional sector.[2] They account for a large

part/...

1. A Berry and R H Sabot: op.cit. p.1220

2. For a description of small cane producers see above Chapter 1 pages 48-50.

part of the cane production and employment in the Island. On the other hand Government is the largest employer of labour in the urban sector and the wage paid in the public sector may be said to be determined institutionally and independently of the level of employment, in conformity with Tidrick's hypothesis regarding wage determination in the mining sector. Our purpose will be to show that these models provide a useful basis for the study of the part played by Government in the recent evolution of the Island labour market.

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Between 1970 and 1975 Mauritius experienced an unprecendented rate of economic growth. GNP at current prices rose at an annual rate of 34 per cent and was more than three times higher in 1975 than in 1969. In real terms national income increased by 43.5%, at an annual rate of 10 per cent. The main factors responsible for this record economic performance were a succession of good sugar crops and record sugar prices. But the exceptional increase in sugar proceeds conceals a substantial rate of growth in other sectors as well. Two other high-growth sectors besides sugar in this forward thrust of the Mauritius economy were manufacturing and construction. The net output of the manufacturing industries (excluding sugar milling and tea processing) increased almost five times between 1971 and 1975 (from Rs 60 million to Rs 298 million) while their contribution to GDP went up from 7% to 11%. The rapid increase in economic activity created a boom in the construction industry where net output (value added) increased by $3\frac{1}{2}$ times between 1971 and 1975.

The record/...

The record economic performance resulted in a rapid increase in employment outside the sugar industry. Between 1969 and 1975, employment in large establishments increased at an annual rate of 7.4 per cent, the largest increases were in manufacturing from 7,811 in 1969 to 22,483 in 1975 and construction from 2,046 in 1969 to 6,034 in 1975.[1] Other sectors like tourism (restaurants and hotels) also contributed substantially to the increase in employment.

Another significant feature was the growth of employment in the public sector which increased from 29,336 in September 1970 to 44,875 in September 1975. Another six to eight thousand people were employed by the Development Works Corporation, which is the agency responsible for the administration of Government labour-intensive public work projects. A job with the Development Works Corporation is considered to be an antechamber for a Government post. People employed by the Corporation constitute a pool of workers to which Government will turn "de facto" to replenish its own labour force. Originally these labour intensive projects were set up in an attempt to "mop up" the excess supply of labour and represented the first stage in the implementation of the Government employment strategy.[2] As it turned out, the scheme has led, among a young, mobile and "modern" population, to a substantial movement of labour from traditional sectors of employment and particularly the sugar industry, to join the "queue" of people waiting for a Government job. It would appear that the establishment of the DWC, in conjunction with the strong pull exercised by the public sector on the rest of the labour market, was largely responsible for the disequilibrium which developed in the Island labour market, characterised

by the/...

1. Source: Central Statistical Office. Bi-Annual Survey of Employment and Earnings.
2. See footnote next page.

by the growing labour difficulties in the sugar and tea industries and other traditional sectors, a persistently high rate of unemployment particularly among the youth[3] and a substantial rate of labour migration.

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In 1969 the Mauritius labour force was estimated at 233,000 people or 29% of the Island population. Employment in large establishments[4] amounted to 112,775. These establishments account for about two-thirds of all employment in the Island. This implies that over 55,000 people were employed in small establishments. The informal sector comprises much marginal and part-time employment. The balance of about 60,000 people was regarded as unemployed. In Mauritius and other developing

countries/...

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3. Percentage of Youth Unemployment(a) to Total Unemployment

	June 1978	June 1979	June 1980	Average 78-80
Male	73.76	77.27	75.66	75.56
Female	51.63	51.46	51.52	51.54
Both sexes	67.13	68.59	67.91	67.88

SOURCE: M A Mansoor:Mauritian Youth Unemployment: Recent Developments and Medium Term Outlook, University of Mauritius, 1981, mimeo.

(a) Defined as the group specific unemployed, aged 15-24, as a percentage of total, group-specific, unemployed.

These figures refer to the unemployed registered at the Employment Exchange.

2. Ministry of Economic Planning and Development: The Development Strategy: op.cit. Ch. IV, pp.59 and 60.

4. The term large establishments refers to enterprises with more than 25 acres of cane or 10 acres of other crop (i.e. tea, tobacco) or employing more than 10 people.

countries it is often hard to draw the line between employment and unemployment or make a precise or meaningful estimate of the number of unemployed. Unemployment in these countries does not have the same meaning as in more industrialised societies.[1] In these conditions it would be more accurate to divide the labour force into two categories: those employed by Government and other large establishments and the others who form part of the residual labour force; and include those who are partially or totally unemployed.[2] According to this classification the number of people in the residual labour force would be equal to the difference between the total estimated labour force and those working in large establishments. On this basis the residual labour force including the unemployed, amounted to about 130,000 people in 1969.[3] In 1975, the labour force was estimated at 273,000 persons; the number of people working in large establishments had risen to 173.289. As a result the number of people in the residual labour force would have fallen to 100,000 as a result of the increase in urban jobs.

For the purpose of the present analysis we divide the labour market into two sectors: the rural sector consisting of the small cane producers and casual agricultural labourers[4] and modern urban sector dominated by Government. We need to

establish/....

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1. Eglier P: Problèmes et Perspectives de l'Emploi à la Réunion; op.cit. Ch 1, pp.18-22; see also P Hein: op.cit. Ch2, p 66, footnote 3.
2. For an analogous use of the term residual labour force to cover both people working in the traditional sector and unemployed, see C R Frank, op.cit. p.255.
3. See above, Chapter 2, page 105, Table 10.
4. Many small cane producers also work as casual labourers on sugar estates.

to establish the existence of (1) a significant income gap between the two sectors, (2) a substantial rate of labour migration between the rural and urban sectors (3) a high and rising urban (Government) wage. We have seen already that there was a rapid increase in wages and earnings in the Government and other wage-regulated sectors after 1970.[1] We shall show that the other two elements were also present in the recent evolution of the Island labour market.

(1) The Income Gap

With regard to the income gap between the rural and urban sectors, the average earnings of daily-paid workers in Government have been consistently below that of labourers in the sugar industry.

TABLE 25 : Average Earnings of Daily-Paid Male Agricultural Labourers

	1970	1971	1972	1973	1974	1975
	Rs	Rs	Rs	Rs	Rs	Rs
Sugar Industry	6.08	5.93	8.12	8.10	10.37	11.22
Government	5.89	5.84	6.33	6.88	8.11	10.44

SOURCE: Central Statistical Office: Bi-Annual Survey of Employment and Earnings in Large Establishments.

In 1976, The Mauritius Chamber of Agriculture published comparative figures of the rates paid to skilled and unskilled labourers in the sugar industry and other industries. These are reproduced below:

TABLE 26/...

1. See above pp.136-139.

T A B L E 2 6 : Comparative Wage of Skilled and Unskilled Workers - 31 December 1975

Industry	Category of Worker	Wage Rs/day	COLA Rs/day	Total Rs/day
Sugar	Agric. labourer (crop)	15.60	3.80	19.40
	Agric. labourer (intercrop)	12.30	3.80	16.10
Tea	Grade I labourer	8.50	3.17	11.67
	Grade II labourer	7.30	3.02	10.32
Construction	Unskilled worker	8.50	2.93	11.43
Export Processing Zone	Unskilled worker	7.50	2.49	9.99
Trade and Distribution	Unskilled worker	9.23	2.59	11.82

Source: Chambre d'Agriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre dans l'Industrie Sucrière, Ch 4, p.38.

On the other hand, according to a recent confidential World Bank Report on Mauritius, the average monthly - equivalent wage of a daily-paid worker with the Development Works Corporation - including both skilled and unskilled workers - was superior to the wages paid to the same category of worker in large establishments and Government.

T A B L E 2 7 : Average Monthly-Equivalent Wage of Daily-Paid Worker

(Rs in current prices)

	1976	1977	1978	1979
A. Large scale establishments and Government	361	428	501	549
B. Development Works Corporation: Skilled workers	446	576	582	636
Unskilled workers	386	465	501	548
C. All workers	416	520	542	592

SOURCE: Report of the World Bank: Mauritius: Present Economic Developments and future prospects, September 1980.

However when looking for evidence of an income-gap between people working in the rural sector - small planters and casual labourers - and Government we must also consider the following factors:

(i) The Security of Employment and Promotion Prospects: Many observers have attributed the disinclination of people in Mauritius to do agricultural work to the casual nature of such occupation: Luce (1958), Meade (1960), Balogh (1963) and more recently the Mauritius Chamber of Agriculture (1973 and 1976). Although the large majority of labourers on estates are employed on a permanent basis, a number of labourers are still employed on a casual basis during the crop to supplement the regular labour force. These casual labourers only account for about 5 per cent of the crop time labour force, but may have an important influence on the progress of the crop.[1] They also provide the main source of outside labour for small planters who have been facing increasing difficulties to recruit labour during the crop. According to the Chamber of Agriculture[2] a way out of this problem would have been for small producers to offer permanent employment to their crop time labour force. When faced with the choice between seasonal work in the sugar industry or prospects of a permanent job with Government even at a

lower/...

1. Mauritius Chamber of Agriculture: Labour Shortages in the Sugar Industry (1973); Chambre d'Agriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre dans l'Industrie Sucrière (1976).

2. Chambre d'Agriculture de L'Ile Maurice: Problèmes de la Main d'Oeuvre dans l'Industrie Sucrière. But such a measure might prove financially unmanageable in the case of very small producers as it might involve them in additional expenditure for fringe benefits which are not payable to casual labour.

lower rate of pay, it is quite understandable that people employed in the traditional sector should prefer the latter. According to the Mauritius Chamber of Agriculture, the movement of labour from sugar cane to the Development Works Corporation or "relief work" is partly due to the fact that only large sugarcane producers offer employment all the year round. "... one should not be so surprised that workers should look for year-round employment even at relatively lower wage levels preferably to seasonal or occasional employment."[1]

Besides promotion prospects will determine the expected rate of increase of wages over the worker's time horizon. Wages in Government are characterised by long scales, a system of annual increments, a periodical revision of wages and promotion based on seniority. Casual workers are promoted to the permanent establishment after two years of service in Government, while workers enrolled with the Development Works Corporation become casual workers after five years of service (and join the Government permanent and pensionable establishment seven years after first joining the DWC)[2,3]. These conditions generally apply to all grades of workers in the public sector. Thus an unskilled labourer once he

joins/....

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1. The Mauritius Chamber of Agriculture: Report on the Problem of labour shortage in the sugar industry, May 1973, mimeo: p.11.
2. It was reported in the local press (L'Express - 6 August 1979) that 7,500 workers of the Development Works Corporation had been promoted to the Government permanent and pensionable establishment. This was said to be a recurrent feature of Government labour policy.
3. Problèmes de Main d'Oeuvre dans l'Industrie Sucrière: op.cit. Ch 5, p.63.

joins the Government permanent establishment may be assured of a substantial improvement in wages and relatively good prospects over his working life. Contrast this situation with that which prevails in the sugar industry characterised by limited promotional opportunities.[1] According to a recent report of the Chamber of Agriculture, with the present organisation of field labour on estates, the desire of labour for promotion is rarely satisfied. Most promotional jobs are found outside the agricultural sector and labourers stand only a slim chance (1 in 24) of being promoted to the rank of sirdar.[2] Prospects of a much more rapid promotion to a secure position in Government will have therefore an important bearing on the labourers expected future income, hence his preference for a Government job. To quote from J R Hicks: "While it is very easy to become a casual labourer, it is much more difficult to stop being one."[3]

(ii) Another important factor that should be considered in the implicit calculus that determines the worker's choice of employment concerns the effective number of hours worked. It is widely known that Government work is much lighter than work on sugar estates and due

allowance/....

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1. Professor Meade argued that one of the reasons for the unattractiveness of plantation work was the limited promotional opportunities - J E Meade, et. al. op.cit. Ch 4, p.61 §4:9.

2. Chambre d'AGriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre dans l'Industrie Sucrière: op.cit. Ch 4, pp.42,43.

3. J R Hicks: The Theory of Wages, 2nd edition. O.U.P. Ch 4, p.69.
"The gate into casual employment stands wide open, and can always be entered by the unemployed of other trades. The way out is much harder."

allowance must be made for this when comparing the wages paid in both sectors. Work on estates is paid by the task each labourer, or group of labourers, having to complete the assigned task in order to receive the minimum rate. This does not appear to be the practice in Government, where people are paid on the basis of attendance rather than performance at work. If there was some way of comparing labour productivity in Government and in the sugar industry, it is very probable that the "effective" Government wage rate - i.e. the wage rate paid for an equivalent amount of work in Government - would be found to be comparable with, if not higher than, the rate paid to labourers in the sugar industry.

If L is the actual number of man hours spent on a job, L' the standard number of man hours required for the job (measured in some way or other), W the actual rate per hour, and W' the effective rate, then $W' = \frac{W \times L}{L'}$; the greater the excess of L over L' (actual hours over standard hours) the higher W' over W.[1,2]

(iii)/...

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1. On this point the Mauritius Chamber of Agriculture expressed the opinion that "the level of earnings in the sugar industry on the one hand, and the DWC, Relief Work, and the Tea Development Authority on the other should be related to the different levels of productivity involved, or inversely that the level of output required per individual in the various fields of employment should be standardized." The Mauritius Chamber of Agriculture: Report on the Problem of Labour Shortage in the Sugar Industry. Op.cit. p.11.

2. In his survey of rural labour markets in less developed countries, Stern (1977) makes a distinction between labourers and labour, in the specifications of inputs. This distinction concerns the appropriate specification of inputs and factors. "The direct input into production is not the number of labourers and the number of hours worked but the task performed. Such task can be defined in terms of ploughing or weeding a field to a certain standard or applying fertiliser. It does not matter to production (but it does make a difference in terms of labour costs unless labour is paid strictly

(iii) Thirdly Government work carries a higher status than work on plantations. Writing about labour conditions in Jamaica Tidrick compared plantation work to garbage collection. "Garbage collection is a low status and unpleasant job, but probably no less so in Jamaica is agricultural work, which is paid only half as much."[3] In his study of plantation economies, Beckford refers to the high reserve price of plantation labour. He writes that in all plantation economies today shortage of labour for plantation work coexists with massive unemployment and underemployment. "This suggests that those who make up the pool of unemployed labour services have a higher reserve price for plantation work than can be met from plantation wage.[4] The Mauritius Chamber of Agriculture studied the problem of labour shortages in the sugar industry. It drew attention to the fact that the average earnings of labourers on estates were substantially higher than the wages of equivalent grades in Government, higher even than the initial salary of a Government clerical officer. Yet a Government job is considered to be superior to that of an estate labourer. "In these

conditions/....

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by piece or task rate), whether it took four hours or eight hours to apply a given quantity of fertiliser to a field (assuming an even density and similar care). This transformation of labour into tasks is a behavioural phenomenon and an allocation decision is blurred by the use of a production function which depends on labour. Thus we should try to keep production functions closer to the technical phenomenon and model behavioural and allocation decisions explicitly rather than sweeping them into a production function which has a technical appearance." - Stern: On Labour Markets in Less Developed Countries: Op.cit. p.65.

3. G Tidrick: Op.cit. p.321.

4. G L Beckford: Op.cit. Ch 2, p.50.

conditions we must conclude that in the choice of employment psychological and sociological considerations are as important as economic ones.[1]

We have established that there is an important difference between the conditions of employment in the industry and in Government, which would induce workers to prefer a Government job even at lower rates of remuneration to field work on estates and in the industry generally. But that choice concerns not so much the permanent labour force as the casual or additional labourers who are recruited on estates seasonally to help with the harvest. They also supply the "wage" labour force on small plantations. They are drawn from the residual labour market where wages are often substantially below wages paid for comparable work in the more organised parts of the economy. Wages paid by small entrepreneurs are comparable to and in some cases lower than wages at the Development Works Corporation and the work is far less regular and much more exacting. No wonder therefore that Government through the intermediary of the Development Works Corporation exerts a strong pull on the labour force in that sector.[2]

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(2)/...

1. Chambre d'Agriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre dans l'Industrie Sucrière: Op.cit. Ch 4, p.38.
2. Mauritius Economic Review 1971-1975, part II, Ch 7, p.35.

(2) Rural-Urban Migration

There remains one more important element to consider in our adaptation of the Tidrick model to the local situation: the existence of internal migration. This factor does not have the same significance in Mauritius as it would in a larger country and distance to work is less important here. Besides the demarcation between town and country, urban and rural, is less clear-cut or meaningful in this small crowded Island.[1] Thus many persons in Mauritius live in the rural (or peri-urban) regions and work in the towns and, in these circumstances, the transfer of labour from rural to urban occupations may not necessarily involve the migration of people to the towns. Location may be a more important factor in agricultural employment than for an urban occupation, as working hours and transport facilities may be more restrictive with regard to the choice of residence in the former case than in the latter. With those qualifications the study of the changes in the distribution of population in the Island between 1962 and 1972 reveals the following facts:

(i) a comparatively low rate of growth of population within the Port Louis municipal area: Port Louis Geographical District 11.69%, Island average 21.21%; a moderate growth of population in other towns; a very high rate of growth in the suburban localities and in the vicinity of the main towns;

(ii) a decline of population in the outlying districts;

(iii) a large scale redistribution of population within the Port Louis district following the 1968 racial disturbances.

Besides about/...

1. Mission d'Aménagement du Territoire de l'Ile Maurice (MATIM), III p.47. Evolution de la répartition de la population par communautés à Port Louis et aux environs.

Besides about 6,500 people left Mauritius during that period mostly from the General or Chinese population.

These findings indicate that there has been a fairly substantial movement of population from the outlying/rural districts to urban localities. This is shown in Table 28, and may be roughly equated to the difference between the rate of growth of population in the Greater Port-Louis and Plaines-Wilhems conurbation on the one hand and in the rural localities on the other. Without emigration the estimated growth rate for the Greater Port-Louis region would have been 22.9 and the difference between urban and rural population growth would have been greater still i.e. an overall rate of 23.9 per cent for urban regions compared with a rate of 19.9 per cent for rural districts.[1]

Other details regarding the changes in the geographical distribution of population between 1962 and 1972 can be obtained from Table 28.

As the figures show there was a fairly sizable rate of internal migration during that period, amounting to about 3 per cent of the total population (the average of the 1962 and 1972 population). Districts with a net positive flow of immigrants were Plaines Wilhems, Black River, Moka and Pamplemousses. As mentioned in the previous page, the regions which have seen the highest rate of population growth are all situated in the vicinity of the main towns

and/....

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1. We assume that those who emigrated came from the urban districts, a plausible assumption considering the ethnical origin of the emigrants (mostly from the General and Chinese population, who are predominantly town-dwellers).

T A B L E 2 8 : Internal Migration - 1962-1972

District	(i) 1962 Census adjusted for under enumeration	(ii) Changes due to Births, deaths, external migration between 1962-72	(iii) 1972 Census pro-rated to estimates based on 1962 Census and under enumeration	(i)+(ii)-(iii) Internal migration (1962-72)	Yearly average
Port Louis	120,689	22,308	135,616	-7,381	-738
Pamplemousses	57,243	11,898	69,782	+1,641	+164
Rivière du Rempart	53,638	15,176	67,805	-1,009	-101
Flacq	73,511	20,518	90,127	-3,902	-390
Grand-Port	69,448	16,687	81,695	-4,440	-444
Savanne	46,666	10,926	53,652	-3,940	-394
Plaines Wilhems	209,467	39,359	261,827	+13,001	+1,300
Moka	37,475	9,031	49,198	+2,692	+269
Black-River	18,682	4,468	26,488	+3,338	+334
Whole Island	685,819	150,371	836,190	-	-

SOURCE: Central Statistical Office (Unpublished).

and form part of Plaines Wilhems, Black-River and Moka districts. The net positive figure in the case of Pamplemousses is probably explained by the development of tourism in that region, and the proximity of Port-Louis. On the other hand the more outlying rural districts of Rivière du Rempart, Flacq, Grand-Port and Savanne experienced a net loss of population during that period. The internal movement of population thus reflects the development of new industries and the attractiveness of these new urban sectors of employment relatively to traditional employment in and around the sugar industry, and other rural occupations, as most of the new manufacturing industries were located in the Greater Port-Louis region and Plaines-Wilhems.

Conclusion

This last section represents a preliminary attempt at applying the wage-gap hypothesis to the local situation. Without further research, however, we cannot formulate meaningful conclusions regarding the likely effect of Government policy on the re-allocation of labour in the island; at the most we can indicate the possible outcome of these measures, if the assumptions of the Harris-Todaro and Tidrick models are applicable to Mauritius. With these reservations, and in the presence of a substantial gap in the "effective" wage rate between the Government and non-government sectors, we can expect the following results from the continuation of the Government crash employment programme.[1]

(i)/...

1. The creation of the Development Works Corporation formed part of the Government crash employment programme. This "Travail-pour-tous" programme had three main objectives:
   (1) to provide employment and income for unemployed heads of households;
   (2) to eliminate much of the sub-marginal employment in the informal sector;

(i) The policy of generating new employment opportunities by means of Government "make-work" projects, by increasing the number of jobs and especially the rate of hiring in the public sector, may accelerate the withdrawal of labour from the sugar industry and other traditional sectors and increase both the number of unemployed and the rate of urban unemployment and underemployment.[2] This will lead an increasing number of labourers to withdraw from the sugar industry and will aggravate the labour shortage in that industry.

(ii) The decline in productivity which may result from an increase in the rate of recruitment of labour in the public sector, will lead in turn to a widening of the existing "effective" wage-gap. This will attract still more labour from the sugar industry and other traditional sectors in search of a Government job. In an attempt to reduce or close the gap and retain their labour force, employers in the sugar industry may be induced or forced to increase the wage or reduce the size of the tasks. Thus the decline in the rate of labour performance may spread from the Government sector to the sugar industry and from the sugar industry to other sectors, until eventually all sectors experience the same low rate of productivity.

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(3) to 'capitalise' the abundance of labour in order to create labour intensive investment.
Ministry of Economic Planning and Development: Development Strategy IV p.80.

2. An increase in the rate of hiring of people by Government or DWC often leads to an increase in the number of the registered unemployed at the Government Employment Exchange. This fact has been verified on a number of occasions. See P Hein: Les Relations Industrielles à l'Ile Maurice, op.cit. Ch 2 p.69.

C H A P T E R 4

THE PLACE OF THE SUGAR INDUSTRY IN THE MAURITIAN ECONOMY

MAURITIUS 1974 - A SOCIAL ACCOUNTING FRAMEWORK

The Importance of a Social Accounting Matrix

After having studied, in the previous chapter, the micro-economic aspects of Government labour policy and the part played by Government wage regulations in the evolution of the wage structure in the Island, we shall consider in this chapter the macro-economic aspects of labour policy and particularly the constraints facing Government in the formulation and implementation of that policy. We begin our investigation with the following statement made by Meade, in his report on the economic and social structure of Mauritius.[1] "In Mauritius the danger of pushing up wage costs is much more serious (than in UK), for the general level of money prices is set by the outside world economy; if wage costs rise relatively to selling prices the main result will be a smaller field for the profitable employment of labour; a higher real wage for those in employment but only at the expense of mass unemployment." It will be our aim in this chapter to investigate the pattern of wage-price relationship in Mauritius and the nature and importance of linkages between the sugar industry

and/...

1. J E Meade "et al": Op.cit. Ch 2, p.11 §2:22.

and the rest of the economy. We shall also study the importance of the structural and institutional constraints which result from the monocrop nature of the Island economy.

Our investigation begins with an analysis of the effects of wage increases in the economy. These can be classified into price-raising effects, household income effects and real product effects.[1] The full impact of wage increases involves a combination of these three effects. Many investigations of the price-raising effects of wage increases are inadequate to the extent that they leave out of account the secondary or induced effects of wage increases. For any one industry the price-raising effects of wage increases will stem not only from increases in the primary input costs - that is labour costs - but also from increases in the costs of materials. These are likely to increase because of price increases in the other sectors induced by wage increases in those sectors. A consequence of industrial inter-dependence is that/the full determination of the sectoral price-raising effects (of wage increases) has to account for the multiplier effect that one sector's price increase has upon another. Standard input-output techniques enable us to quantify these indirect effects and thus estimate the full effect of wage increases on the level of costs and prices in the economy.[2]

Besides an increase in the wage and salary payments will lead to a direct increase in household income. In the Social Accounting Matrix, where factors have been distinguished from

institutions /....

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1. C G Hayden "et al": The Botswana Economy. Some Analyses of the Impact of Increases in Government Wage and Salary Rates. University of Warwick, mimeo, pp.4-6.
2. Idem: pp 4, 7.

institutions - households, firms and Government - the increase in the wage and salary payments to labour will be received by the households in the form of an increase in their income accruing from labour services.

On the other hand, the increase in wages and salaries may lead to a decrease in the operating surplus of firms - to the extent that producers are not able to pass on their cost increases in the form of higher prices. If prices are fixed - as for those industries selling most of their output in the export market - the whole of the cost increase will be absorbed by a fall in the operating surplus. The decrease in the operating surplus will in turn be passed by the firms to other institutions - households and Government - by means respectively of a reduction in distributed profits and tax revenue - and to the capital account by means of a reduction in savings.[1] So changes in factor income may result both from an increase in wages and salaries, and a decrease in the operating surplus of certain production activities. These changes may be called the first-round effects of wage and salary increases.

The increase in household income will lead to an increase in savings, tax revenue and household expenditure. If we assume a constant average propensity to save, we can calculate the additional disposable income available for expenditure on goods and services, after allowing for the price-raising effects on domestically produced commodities of the increase in wages. We can then proceed to determine the real output effects of

the/...

1. Interinstitution transfer payments are shown in the block of cells at the intersection of institution rows and columns in Tables 29 and 30*. These institutional transfers represent an important aspect of Government social and economic policy.

* See below pages 231 and 241.

the first-round increase in household income.

We shall assume that households spend their additional net disposable income "pro rata" across all commodities, both domestic and imported. An increase in the real demand for domestic goods, will lead, under certain assumptions, to an increase in the real output of these goods. The increase in real output, in turn, increases factor incomes, the intermediate demand for imports and Government revenue in the form of indirect taxes. Thus the increase in household expenditure out of the initial (first-round) increase in factor income, will generate additional household income which will lead to further increases in savings, taxes and expenditure. This may be termed the second-round income effects.

An analysis of the price, income and real product effects of wage increases requires a number of assumptions. These assumptions will determine the importance of the secondary or induced effects in each case. Thus the price effect of wage increases will depend on the market structure, which will determine the extent to which cost increases are passed on into prices. The income effect will depend on the source of income, i.e. the importance of wages and salaries in household income. Finally the real product effect will depend on the behaviour of households and on their propensity to consume following an increase in real income. The estimation of effects of wage policy, thus requires a number of assumptions at each stage of the analysis, and the results obtained regarding the overall effect on prices, income or the demand for commodities, of a given increase in wages, will reflect these assumptions.[1]

The common/...

1. The types of assumptions required at various stages in the estimation of the effects of wage increases are described in C Hayden "et al": The Botswana Economy: Op.cit.

The common source of information on household behaviour is generally provided by a Household Expenditure Survey. Unfortunately the last available survey in Mauritius dates back to 1962. This information would be of little use for our purposes, when we consider the important changes which have taken place in the structure of production and the pattern of consumption since that time. (A comparison of the changes in the weights used in the previous (1962) consumer price index and the new one (1972)[1] gives an idea of the extent to which the structure of consumer demand has changed between these dates.) The absence of a Household Expenditure Survey represents an important lacuna in our attempt to prepare an integrated set of social accounts for Mauritius.

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The Social Accounting Matrix

The main macro-economic aggregates - the national product, national income and national expenditure - are conceived as forming part of a circular flow. . . The fundamental circularity of the process of income production, distribution and expenditure provides the systematic background for the compilation of the national income statistics. It enables a more flexible decentralized approach but imposes the need for numerical consistency between the various sets of data as an essential condition for the validity of the whole exercise.

The SAM incorporates within an integrated system of accounts a comprehensive description of the economy covering the production, . . institutional and foreign trade sectors. It aims at providing a coherent quantitative picture of

1. Due to certain technical problems we were not able to use the findings of the 1972 Survey for a detailed classification of households.

the economy which describes what is happening in the areas of production, distribution, trade and accumulation. The arrangement of accounts within the SAM is a conscious attempt to capture the circular flow of income. It provides a quantitative description of the functioning of the economy by means of a set of accounts and data organised around the production and consumption of goods and services.

In essence the SAM consists of the integration of different sets of accounts, each referring to a particular aspect of economic activity, into a single matrix. It aims at showing within a single coherent data system, the relevant aspects of economic activity.[1] The Input/Output matrix forms the core of the SAM. It records the transactions that take place within the production sector and between that sector, the institutional sector and the rest of the world. The production sector produces goods and services and generates income.[2] The nature of production activities will determine the rate of performance of the whole economy. For these reasons, and because of its focal role in the economic system, the production sector has been dubbed the engine room of the economy.[3] Thus the SAM presents a consistent macro-economic information system which helps to answer questions which arise at the disaggregated level; and in that way to probe into the hidden part of the economic "iceberg."

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In/...

1. G Pyatt & A R Roe: Social Accounting for Development Planning, Cambridge University Press, Ch 3, p.72.
2. "Tout part de la production. La production nous permet à la fois de nous procurer les biens dont nous avons besoin et les revenus necessaires à leur achat." J M Albertini: "Les Rouages de l'économie nationale", Editions Ouvrières, Paris, 1960 Introduction p.11-12.
3. G Pyatt & A R Roe: Idem: Ch 3, p.44.

In every economy the distribution of income influences the pattern of expenditure, which determines the structure of production. The structure of production in turn influences factor payments and hence income distribution. Production, income distribution, and expenditure thus interact on each other giving rise to a cumulative process which may have a strong influence on the pattern and the rate of economic growth. It must be government concern through its economic and social policy to monitor these developments.

Government social policy and especially its labour policy has strong redistributional effects within the economy. To the extent that different classes of society have different propensities to consume and save and to the extent that the production of certain goods rely more heavily on imports than others, it follows that these redistributional measures may have important effects on the rate of saving and the propensity to import hence on the rate of internal inflation and the Balance of Payments.[1] A shortage of savings and foreign exchange may thus represent two important constraints facing Government in the implementation of its labour policy.

This chapter presents the outline of a SAM for Mauritius. The data was obtained from the Central Statistical Office and other sources (i.e. Ministry of Prices, Bank of Mauritius) and relates to 1974. Our main purpose is to lay the basis for a study of the effect of labour policy on income distribution and the macro-economic equilibria and to determine the effective limits imposed by the structure of the economy on Government

wage/...

1. B J Knight: Wages and Zambia's Economic Development: Op.cit. Ch 4, pp.92-93.

wage policy. At the same time, the exploration of data has brought to light certain inconsistencies and gaps in the national accounts and may thus help in the task of developing a more modern and more consistent system of national accounts for Mauritius.

The SAM concentrates on problems connected with the production of income and its distribution. Redistributive forces are the centrepiece of Government policy and planning strategy and the SAM provides a systematic arrangement of data for the modelling of labour policy with regard to (i) the sources of income accruing to institutions: households, firms and Government, (ii) the importance of transfers between institutions, (iii) the macro-economic implications of Government labour policy. Besides by the disaggregation and classification of factor income among spending institutions and by bringing together in a single coherent framework the main bodies of data concerning intermediate transactions, final demands and capital transactions within the domestic economy and with the outside world, the SAM provides a useful quantitative information system which can be applied to the analysis of a wide range of empirical problems.

A major obstacle in the preparation of the SAM has been the absence of a Household Expenditure Survey which provides the basic source of information for the disaggregation of factor and institutional accounts - especially labour and households accounts. Without such a survey, and the detailed information that it provides for the disaggregation of factor income and household consumption expenditure between different categories of households, there would be no way of classifying households for the purpose of the SAM. Thus, in the absence of a Household Expenditure Survey an essential element is missing.

In/...

In the SAM presented in this chapter, households are aggregated into a single account. As a fundamental purpose of the exercise is to provide a data base for the study of the flow of income between and within institutions, the classification of households by income groups is an essential part of the work.[1] Owing to the unavailability of recent data on the distribution of income between households, and their pattern of expenditure, an important part of the local economic system must remain unexplored.

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The Structure of Economic Dependence

Economic activity in developing countries is generally centred on the production and sale of one or a few cash crops. This gives rise to a high degree of specialisation and weak intersectoral linkages, important structural rigidities in the domestic economy and a high dependence on overseas markets. In Mauritius economic activity gravitates around the cultivation of cane and the manufacture and export of sugar. The production and marketing of sugar polarises the whole economic system. Cane cultivation dominates the agricultural sector and accounted in 1974 for 88 per cent of the value added in agriculture, sugar manufacture likewise dominates the manufacturing sector and contributed 57 per cent of net manufacturing output in that same year.[2] A number of activities: transport, garages and

workshops,/...

1. G Pyatt and J I Round: Social Accounting Matrices for Development Planning. Review of Income and Wealth, December 1977, p.340.

2. 1974 was an exceptional year for sugar. In 1976, by comparison, the value of cane production and sugar manufacture were 76 and 47 per cent respectively of agricultural and manufacturing net output.

workshops, banking and insurance provide the necessary physical and financial infrastructure for the handling, processing, financing and export of the sugar crop. They can be described as satellites of the sugar industry, which accounts for a substantial part of the output of those activities.[1,2] Otherwise the transactions between the sugar industry and the rest of the economy are generally small.

Our aim in this chapter is to develop a framework for the analysis of the effect of wage increases in the sugar industry and other employment sectors upon the macro-economic balance, particularly the Balance of Payments on current account and the net revenue position of Government.[3] More specially we wish to investigate the importance of the structural constraints which result from the monocrop nature of the island economy and restrict the scope of Government action in labour matters. A comprehensive analysis of the effects of Government wage legislation implies a detailed knowledge of the structural particularities of the local economy. For the impact of these measures on costs, prices and income must depend to a very large extent on the importance of sectoral rigidities and the interdependency between the various sectors.

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The Choice/...

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1. On the concept of satellite industries, see A O Hirschmann "The Strategy of Economic Development". Yale University Press. New Haven 1958, Ch 6, pp.102-104.
2. Sugar Estates with Factories accounted for 24 per cent of the total Gross Output of

   Transport (Passengers and Goods): (A/c Nos.23 to 25) and 12 per cent of the Gross Output of Garages and Workshops (A/c No.29).

   The figure of 12 per cent covers only repairs and maintenance work done on the estates; it does not include work done for the estates by outside garages.
3. See footnote next page.

The Choice of 1974

The SAM relates to 1974. The choice of 1974 was dictated by the following considerations:

(i) The need to select a representative year. In the case of Mauritius it means essentially a cyclone-free year. This ruled out 1975.

(ii) The availability of data: Certain changes were brought by the Central Statistical Office to the method of classification of data for the purpose of the compilation of the National Accounts, which made the 1974 data more useful for this work than that of previous years. On the other hand, the work was begun in the last quarter of 1976, and we did not then have access to the more recent data (i.e. for 1976 and subsequent years).

(iii) The analysis of employment conditions on estates compares the conditions of labour in 1973 with those of 1965 and it may be desirable that the SAM should relate to the same period.

On the other hand 1974 was a boom year in the sugar industry following a record sugar crop and record prices. The exceptional conditions prevailing in the sugar industry in that year are reflected in the accounts. The operating surplus (including depreciation) of sugar estates with factories was more than seventy per cent of the value of the gross output of cane

produced/....

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3. Public revenue and the Balance of Payments are among the most important targets of Government economic policy in both developing and developed countries. See in this connection U Persad: An Econometric Model of Trinidad and Tobago 1960-71. Social and Economic Studies, Vol. 24 No.4 December 1975, p.402.

produced by estates while the surplus on the manufacturing side was fifty per cent of the gross output of factories. There was a corresponding jump in the income accruing to the cane planters. The large profits made by the sugar industry in that year lead to sharp and short-lived changes in the structure of income distribution in Mauritius. In 1974, wages and salaries represented 21% of the value added in cane production on millers' estates and 22% of the value added in sugar manufacture while they represented 46% and 32% of the value added respectively in 1973.[1] These figures underline the importance of the impact of the 1974 sugar boom on the distribution of income. Allowance should be made for this when studying the structure of the economy and the relative importance of the sugar industry as shown in the SAM.

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Problems of Data Classification

We have said above that the purpose of this chapter is to provide a data-base for the analysis of the macro-economic effects of Government labour policy.

The SAM presented here consists of a set of accounts comprising a conventional Input/Output matrix, an Import matrix and a (physical) manpower matrix, together with a number of subsidiary tables and data. But the SAM and the exploration in data on which it is based, can serve as a basis for a much wider range of studies and research than is directly relevant to our work.

In the/....

1. See footnote next page.

In the construction of the SAM we were faced with a wide variety of statistical problems. These problems concerned the availability, reliability and the form of the data. There is very little information on inter-industry transactions which had to be "filled in" by estimation. In other cases the data had to be reclassified in a suitable form for incorporation in the SAM. For example in the Report of the Customs Department, the imports and exports are classified by SITC commodity groups. For the purpose of the SAM they had to be reclassified among various user sectors.

Owing to the virtual absence of information regarding intermediate inputs, both domestic and imported, a substantial degree of estimation was necessary. The procedure followed in these cases is explained in the Notes.[2] The fact that we had to resort to estimation does not however detract from the value of the work. For our concern is to organise and present in a systematic form the complex network of transactions within the economy so as to answer questions about the structure of production, prices and income distribution; and care and method in the classification of data may be more important in this respect than their accuracy. What we aim at is a structural model of the Mauritian economy to provide an

adequate/....

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1. These percentages are calculated from the figures supplied by the Chamber of Agriculture. In the Input/Output matrix (Table 31 below), the percentage of wages and salaries in cane cultivation and sugar manufacture is 23% and 25% respectively. The discrepancy is due to the inclusion in the accounts for cane cultivation and sugar manufacture in Table 31, of certain items which are not included under these heads in the returns submitted by the Chamber (i.e. transport costs).
2. See pages 279 to 310 below.

adequate reference base for the analysis of Government labour policy, not a set of accurate "business" accounts.

But we must add that the Central Statistical Office has developed an efficient organisation for the collection and generation of data. Information on which the social accounts are based is generally abundant and of good quality. But we face to some extent the same problems found in other developing countries in this respect. The quality of the data very often depends on the importance and the standard of the accounting services in individual firms and industries. At one end, detailed information is available from the Chamber of Agriculture regarding the value of various inputs used in field and factory production on millers' estates. At the other end very little is known regarding the production and costs of a large number of small scale enterprises in the informal sector of the economy - the small cane planters, vegetable and livestock producers, small transport operators and retail outlets. We must therefore bear in mind that a significant part of the data for the SAM "belong to the accounting area of very broad guesswork."[1]

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As pointed out by Pyatt and Roe,[2] the design of the SAM has evolved from the combination of two ideas: the matrix presentation of national income accounts, reflecting the Keynesian model of the economic system in terms of a circular flow of

income/...

1. C O'Loughlin: National Economic Accounting, Oxford Pergamon Press, 1971: Ch 16, p.140.
2. G Pyatt and A R Roe: Op.cit. Ch 3, p.40.

income and resources, and the input-output model of the inter-dependence of production in the economy. Two basic rules apply with regard to the construction and interpretation of these matrices:

(i) for every row there is a corresponding column and the system is complete only if the corresponding row and column totals are identical;

(ii) every entry is a receipt when read in its row context and an expenditure from the point of view of its column. The rows show the sources of income of institutions and the utilisation of commodities, both locally produced and imported, in the form of intermediate sales to various production accounts and final sales to institutions: households, Government, gross domestic capital formation (including inventories) and export. The columns show the expenditure of income of institutions and the structure of production: the intermediate inputs used, both locally produced and imported, and the contribution made - and payment received - by different categories of factors in the production of different commodities. A fundamental principle of National Income Accounts is that Gross Inputs must equal Gross Output; in matrix terms this means that the column totals must equal the corresponding row totals. The various steps involved in the construction of the SAM and the underlying structure and mathematical logic of the system are explained in Pyatt and Roe.[1]

The results of our attempt to construct a SAM for Mauritius based on the 1974 data are presented below. We give first in Table 29 on page 231 a highly aggregative version of the matrix.

More/....

1. G Pyatt and A R Roe: Op.cit. Ch 4, pp.67-83.

More information regarding the entries in each cell of the Table is given in the Notes. For example, the figure of 2186 at 6,6,[1] represents the sum of the inter-industry transactions which are shown in the Input/Output table by means of a 30 x 30 matrix. Similarly the value of imported intermediate supplies for production activities is put at 854 (7,6). Details of intermediate imports are given in Table 31 by means of a 15 x 30 matrix, showing the classification of imports among the various user sectors. Likewise for value added payments to factors of production in row 1, of Table 29, and direct and indirect taxes and other current transfers to Government account in row 4.

As stated above, we were handicapped in our work by the absence of information on households income and expenditure. Our SAM is consequently much smaller in coverage and more incomplete than that for Sri Lanka.[2] We were also limited by time, which compelled us to make use as far as possible of available data in their existing form, hence to adopt the official classification rather than some alternative classification which might have been more appropriate for purposes of economic analysis.

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The SAM/...

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1. The first figure refers to the row number and the second figure to the column number.

2. We used the Sri Lanka SAM as our model, because the methodology involved and various steps followed in the construction of the Sri Lanka matrix are fully documented by Pyatt and Roe in their book,(a) and secondly because, as an economy, Sri Lanka resembles Mauritius in many respects and much more so than either Iran or Botswana, two other countries for which social accounting matrices have been constructed.

   (a) G Pyatt and A R Roe: Social Accounting for Development Planning, op.cit:

The SAM Framework

A highly aggregated résumé of the SAM is given in Table 29. That table combines three sets of accounts: the factor accounts, institutional accounts and production accounts. Factors of production receive payments for their contribution to production and for services rendered to Government, other households and to the rest of the world These payments are treated as income in the factor accounts. They make up the entries in row (1) of Table 29. These factor incomes in turn are "mapped into" household and other institutions current accounts, where they represent the factor income component of the gross income receipts of institutions (rows 2 and 3 of col. 1). Institutions also receive income from other institutions. These inter-institutional transfers consist of taxes paid to Government, profits distributed by companies to shareholders (households), subsidies and other allowances paid by Government and pensions. These transfers appear in the group of cells at the intersection of rows and columns 2, 3 and 4. The transfer of income between institutions represents the essential objective of Government social policy and the sources, magnitude and direction of these transfers are given a prominent place in the SAM.

Institutions distribute some of their income as transfers. The rest they save or spend on domestic or imported consumer goods. This information is recorded in columns2-4. Household expenditure, representing over fifty-six per cent of the final domestic sales of production activities, exerts a strong influence on the flow of goods and services in the economy. The close functional interrelationship between the pattern of demand of households and other institutions, the production structure and income distribution is clearly shown in the SAM.

The/....

TABLE 29 : Social-Accounting Matrix for Mauritius, 1974 (Full Aggregation)

	(1) Factors of production	(2) Institutions current account: Firms	(3) Institutions current account: House-Hold	(4) Institutions current account: Government	(5) Combined capital account	(6) Production Activities	(7) Rest of World (current)	Totals
(1) Factors of production			15	252		2600	-10	2857
(2) Institutions current Accounts: Firms	1133							1133
(3) Institutions current Accounts: Households	1725	250		86			31	2092
(4) Institutions current Accounts: Government		112	187	36	15	251	30	631
(5) Combined capital Account		771	360	87			-301	917
(6) Production Activities			943	63	660	2186	2040	5892
(7) Rest of World (Current)			587	107	242	854	73	1863
TOTALS	2858	1133	2092	631	917	5891	1863	15385

The Capital Account

The capital account describes in the same schematic manner the flow of capital transactions within the economy. Institutions acquire capital funds in the first instance from their own savings. There are also transfers of funds between them through savings of institutions and financial intermediaries. The capital account in the SAM is highly aggregative. In row 5 savings of the various classes of institutions are shown as incomings to a combined capital account, and are used to finance the domestic investment of private institutions and Government. In the highly favourable economic conditions of 1974, Mauritius had a Balance of Payments surplus of Rs 301 million. As the sum of external receipts and payments of a country must, in the end, always balance - every purchase of foreign exchange necessarily implies an equivalent sale and vice versa - the 301 surplus was offset by the net transfer of an equivalent amount of capital overseas.

As a result of the aggregation of the capital transactions of various institutions into a single account, transfers of capital funds between them cancel out. A disaggregation of capital transactions between the different categories of institutions would have recorded these transfers and shown the part played by financial intermediaries and Government in the mobilisation and channelling of capital funds in the economy. The use of a single capital account thus conceals an important aspect of the domestic economic activity.

The Production Accounts

The production sector obtains its revenue from the sale of consumer goods, capital goods (including increases in stocks) or intermediate goods. The value of these sales is shown in

row 6. The revenue which accrues to each production activity is spent partly on purchases of domestic intermediate supplies, which, in terms of the principle which underlies the matrix form of accounts[1], must be necessarily equal in value to the intermediate sales of production activities; partly on imported intermediate goods. The remainder is paid out to the factors of production and represents the chief source of income of institutions. The integration of factor, institution and production accounts into a single matrix thus provides, in a practical schematic form, a model of the flow of transactions within the economy. In an open economy however, the model must incorporate an additional set of accounts dealing with the transactions between the country and the rest of the world.

Transactions with the Rest of the World

Transactions with the Rest of the World are recorded in row and column 7 of the Table. Imports of goods and services comprise three main categories: imports of consumer goods and services by institutions, imports of capital goods and imports of intermediate goods and services for use in production. Part of the imports may also be reexported. Row 7 records the value of imports in each category and column 7 shows the value of exports of goods and services to the rest of the world.[2] The two sets of figures, in row and column 7 show the effect of each production activity on the Balance of Trade; a useful piece of information for an analysis of the foreign exchange situation of individual industries or activities.

The sum/...

1. See above page 228.

2. Goods are very seldom imported directly by institutions but generally by traders. But what is important is the rate of utilization of imports by each sector or activity. In the SAM imports are shown as if they were received directly by the institutions or production activity concerned.

The sum of factor incomes accruing from production activities, Government activities and domestic services with net income from abroad together give a total of 2867. This total represents the Gross National Income at factor cost.[1]

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The Aggregated Matrix

This section will comment on the various figures appearing in Table 29. More details concerning these entries are given in Tables 30 and 31 and in the Notes.

The SAM evaluates the GNP of Mauritius for 1974 at current factor prices at Rs 2,857m, the figure appearing as the sum of row 1 of the table. The official figure is Rs 2,951m. The main cause of this discrepancy of about 3% between the official estimates and our own, is the different treatment of the sugar export duty of Rs 148 million, in the National Accounts and the SAM. In the first instance it is treated as a tax of income and included in the GNP. In the second case it is treated as tax on production and therefore excluded from the GNP. There are other discrepancies between the two sets of figures due in certain cases to certain omissions on our part in the collection and classification of the data;[2] in other cases to the

adjustments/....

1. According to the official statistics the GNP at factor cost amounted to Rs 2,941m in 1974. This gives a discrepancy of Rs 74m or 2.5 per cent between the SAM figure and the official estimate of National Income. The discrepancy is explained by the different treatment of the Export duty on sugar which amounted to Rs 148 million in 1974. The Central Statistical Office regards it as a tax on income; the amount of the duty is therefore included in the value of gross domestic product. In the SAM it is treated as a form of production tax and therefore excluded from gross domestic product at factor cost.

2. See footnote next page.

adjustments we made to the original data in order to eliminate certain inconsistencies which came to light when various sets of figures were confronted with one another e.g. in the estimates of the intermediate consumption of various production activities.[3] As a result of these adjustments, the net output (value added) of other production activities besides sugar has been increased by about Rs 90 million.

The GNP comprises 15[4] representing the amount of wages and salaries paid by households for domestic services, 252 of wages and salaries paid to Government employees, and 2600 paid for the use of factor services in production. The last figure (-10) represents the net factor payments to the rest of the world - the debit side of the account consists of repatriated profits of overseas companies while the credit entries consist mostly of interest received by Government (Bank of Mauritius) on its external assets (Treasury Bills and other Securities). Column 1 shows that 1725 of the total GNP was distributed to households as income. This figure includes the income of unincorporated enterprises. The balance of 1133 represents the profits of firms. The high share of profits in national income reflects the exceptional conditions of 1974.

The total/...

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2. According to the National Accounts net factor income from abroad showed a surplus of Rs 10 million. The SAM shows a net outgoing of Rs 10 million on that account.
3. See G Pyatt and A R Roe: Op.cit. p.xx-xxi for an explanation and justification of these procedures.
4. The figure 15 stands for Rs 15 million; likewise the figure 252 and the other figures which appear on this page and on the following pages.

The total value of production activities (col.6) amounted to 5891 and was made up as follows: 2,600 paid to factors of production, 251 paid to Government in the form of indirect taxes, 2186 for the purchase of supplies from other production activities and 854 for imported supplies. Row 6 shows the disposal of the total domestic production: 943 was consumed by households, 63 was used by Government, 660 was used for capital formation including stock accumulation, 2186 represented the value of intermediate sales to other production activities and 2040 the value of exports. The entries in row 6 have been valued at ex-factory or producer prices and can be converted to market prices by adding the figure of 172 representing the value of indirect taxes net of subsidies.

The account for transactions with the rest of the world appears in row and column 7. Column 7 shows the sources of foreign exchange earnings. The value of domestic exports amounted to 2040, of which sugar accounted for 1582. Other entries in column 7 relate to net remittances received by households and Government from overseas, amounting to 31 and 30 respectively and net income of 10 paid overseas (the amount of profits remitted overseas). There is also at the intersection of row and column 7, a figure of 73. This represents the value of re-exports, the bulk of which (63) consisted of fuel supplied to ships and planes. Row 7 shows the imports of goods and services to the main sectors of the economy.[1] Total imports amounted to 1863. More than half of the imports was used in production, households consumed 587, and 107 was used by

Government/...

1. The imports are valued at c.i.f. prices, and exclusive of import duties which are included in row 4.

Government. There were also 242 for imports of capital goods (including an estimated increase of 61 in stocks). Exports of goods and services totalled 2164 and imports 1863, giving a surplus of 301 in the Balance of Payments. This surplus appears at (5,7) as a minus figure implying that an equivalent amount was lent to the rest of the world.[1]

We turn now to the current accounts of institutions in rows and columns 2 - 4, and the combined capital account, in row and column 5. Firms receive their income from the profits of production activities. Column 2 shows how this income is spent. 239 is transferred to households as distributed profits and 11 as pensions, 112 to Government by way of taxes (75) and other current transfers (37) and the balance of 771 represents firms' savings which in the SAM form part of the entries to the combined capital account (5,2).

As we have seen before, households receive incomes of 1725 from the combined factor account (3,1). They also receive transfer payments from firms and Government; in the case of firms, these transfers consist of undistributed profits and pensions totalling 250; in the case of Government the figure of 86 includes a number of items which are detailed in Table 41 (in the Notes). The last entry denotes net remittances from overseas which

amounted/...

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1. According to figures published in the Annual Report of the Bank of Mauritius imports of goods, merchandise services and factor services in 1974 amounted to Rs 1902 million, made up as follows: Rs 1526 million of merchandise imports (including 5 million of non monetary gold), Rs 191 million for freight and insurance, and other services amounting to Rs 185 million. In the SAM total imports of goods and services (cif) is put at Rs 1832 million, Rs 70 million (or 3.7 per cent) less than the official figure. This discrepancy may be due to the under-recording of factor services in the SAM.

amounted to 30. Altogether households income from all sources amounted to 2092. This income was spent as shown in column 3, on the following items: 15 on household services, 187 on taxes and other transfers to Government, 943 on domestic goods and services and 576 on imports. The surplus of household income over expenditure is 360 and the figure represents household savings and appears as an entry in row 5 of the table.

The Government current account appears in row and column 4 of Table 29. Government current revenue consists of taxes and other transfer payments by firms and households. These items have already been covered. There are also transfers within Government between central and local authorities (36), indirect taxes paid on production activities (251) and duty on imports of capital goods (15). The last entry at (4,7) represents the value of exports of Government services and receipt of factor income on Government investment overseas. On the expenditure side of the Government current account (col. 4) we find the following entries: 252 spent for wages and salaries. This figure includes a nominal figure of 23 representing the (imputed) pension contributions of Government employees.[1,2] The other entries in col. 7 are 86 of transfer payments to households, 36 paid to local Government, 63 spent on domestic goods and

services/....

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1. The Government pension scheme is non-contributory. However Government employees make a compulsory contribution to the Widows' and Orphans' fund. This amounted to Rs 2 million in 1974. It is treated as a direct tax paid by households and included in the 187 of household transfer payments to Government.

2. This procedure follows the recommendations of the United Nations system of National Accounts (SNA) 1968. For a discussion of the problems posed by the accounting treatment of Government pensions, See Pyatt and Roe: Op.cit. Statistical Appendix 1. p.124.

services and 107 on imports. The surplus balance of 87 represents Government savings and is paid into the combined capital account.

The entries in row and column 5 of Table 1 relate to the flow of savings and investment. Savings of households, firms and Government appear in row 5. These funds financedthe investment in dwellings, non-residential buildings and other construction, machinery and transport equipment and inventories. According to the Central Statistical Office, gross domestic capital formation in 1974 amounted to Rs 750 million (Buildings: 446; machinery and equipment: 290; land: 14) the Central Statistical Office figure does not include stock accumulation. The total investment figure in the SAM (excluding increases in stocks) is 672 and consists of Buildings: 440 and machinery and equipment: 232). There is clearly an important discrepancy between the official estimates of capital expenditure on machinery and equipment and our own figure. This discrepancy is due to problems of classification to which we shall revert in the Notes, (i.e. particularly the treatment of passenger cars and metal and electrical products).

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The Semi-Aggregated Matrix

Table 30 presents a more disaggregated version of the SAM. Changes have been made in the factor accounts and institution current accounts. In Table 29, payments to factors were combined in a single account. Table 30 contains four separate factor accounts, as follows: (i) labour, (ii) housing, (iii) private capital i.e. unincorporated enterprises, and

(iv)/...

(iv) corporate capital. The income received from self-employment, which is classified in the National accounts, as income of unincorporated enterprises (individual enterprises and partnerships) comprises returns to labour services, entrepreneurial activities and the use of land and capital owned by unincorporated businesses. In the absence of information regarding the distribution of assets in the economy it is virtually impossible to distinguish meaningfully between the returns to labour and capital for that class of income; we have therefore treated all the income received from unincorporated business as returns from the ownership of private capital.[1]

Table 30 also distinguishes between the sugar sector and the rest of the economy. It shows the flow of resources within each sector and thus helps to give a better idea of the place of the sugar industry in the economy. It describes quantitatively the dualistic character of the local economy. In that way the SAM provides a useful data base for an identification of the part played by the sugar industry within the economy with particular reference to its influence on the pattern of income distribution. Hence it provides a framework for the analysis of the possible effects of changes in income distribution in the sugar industry, on Government revenue, the rate of saving and investment and the Balance of Payments.

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1. An attempt at distinguishing between the return to labour and capital in the case of income from cane plantations could have been made on the basis of land ownership; but outside the sugar industry, there is virtually no data on the distribution of assets of unincorporated enterprises.

TABLE 30(i) : A Semi-Aggregated Social-Accounting Matrix for Mauritius - 1974

(Rs million)

		Factors of Production								Institutions Current Accounts						Production Activities								
				CAPITAL																				
		Labour		Housing		Other Private		Corporations		Households (Combined)	Firms		Government (Combined)	Capital Account		Sugar	Other Agricultural Activities	Other Manufac. Domestic	Other Manufac. Export	Mining and Construction	Trade and Transport	Infrastructure & Other Services	Unallocated Expenditure	Rest of World	TOTAL
		S	NS	S	NS	S	NS	S	NS		S	NS		S	NS									
FACTORS OF PRODUCTION	Labour	S														377								377
		NS								15			252				29	48	31	120	183	143			820
	Capital: Housing	S																				4			4
		NS																				79			79
	Capital: Other Private	S														180									180
		NS															63	9	7	13	96	76			264
	Capital: Corporations	S														847								-7	840
		NS															7	51	60	27	71	79		-3	292
INSTITUTIONS CURRENT ACCOUNT	Households	S	377		4		180					111	139	34										10	605
		NS		820		79		264						52										21	1486
	Firms	S							840																840
		NS								292															292
	Government	S									53	56			3	151									263
		NS									134		56	36		12		0.3	-59	18	7	68	55	7	30	368
Combined Capital A/C										360	673	97	87											-301	916
PRODUCTION ACTIVITIES	Sugar									13				167		1510		11				1		1583	3285
	Other Agricultural Activities									91						4		30				2		4	131
	Other Manuf. (Domestic									211			2		6	8	3	5	2	49	9	13		76	384
	Other Manuf. (Export									82			2		13	4				31	3	9		140	284
	Mining & Construction									1			32	10	430	7		2		1	3	7			493
	Trade & Transport									265			8		30	50	5	44	17	66	19	49		66	625
	Infrastructure & Other Services									281			19			57	0.2	15	7	11	90	22		171	672
	Unallocated Expenditure															5	0.9			2	6				14
Rest of World										587			107	35	207	80	21	227	140	166	76	137	7	73	1863
TOTAL		377	820	4	79	180	264	840	292	2093	840	292	631	215	700	3285	130	382	283	493	623	675	14	1863	15377

TABLE 30 (ii) : Employment Matrix 1974 - Numbers Employed

Employment by Category	Sector	Sugar		Other Agriculture		Other Manufacture				Mining and Construction		Trade and Transport		Infrastructure and other services		TOTAL	
						Domestic		Export									
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0.1/1.3	Professional, technical and related workers	102	6	30	3	218	25	127	10	53	2	254	7	9324	4895	10108	4948
2	Administrative & managerial	132	1	85	1	181	12	143	13	24	-	354	11	575	27	1494	65
3	Clerical and related workers	271	52	146	59	332	153	218	248	182	19	3005	573	5519	2349	9673	3453
4	Sales Workers	1	-	5	-	156	11	41	16	2	-	826	237	433	9	1464	273
6	Agricultural	31232	14206	5265	1648	199	49	5	1	2	-	81	30	4700	340	41484	16274
7.0/7.9	Production Workers*	3894	2	1045	28	849	532	936	6063	165	-	114	3	1638	78	8641	6706
8.1/8.5	Fitters and Craftsmen*	1764	-	101	8	1218	22	911	44	1800	-	904	-	2797	62	9495	136
5	Service Workers	739	10	46	3	217	14	107	24	75	-	850	40	10028	939	12062	1030
-	Others	3949	35	384	7	2000	703	1419	680	2128	2	4681	69	15628	448	30189	1944
	TOTAL	42084	14312	7107	1757	5370	1521	3908	7099	4432	23	11069	971	50642	9147	124612	34830

*1. Production workers: (7-0) Production supervisors & general foremen; (7-5) Spinners & weavers; (7-7) Food and beverage processors; (7-9) Tailors, dressmakers and sewers.

2. Fitters & Craftsmen: (8-1) Cabinet makers & related workers; (8-4) Machinery fitters & rassemblers; (8-5) Electrical fitters and related electrical workers; (8-7) Plumbers, welders, electrical workers, painters and related workers; brick layers, carpenters & other construction workers.

SOURCE: Central Statistical Office: Employment by Occupation, Industrial Group and Sex, March 1977.

T A B L E 3 0 (iii) : EMPLOYMENT MATRIX – PERCENTAGES – 1974

Employment by Category	Sector	Sugar		Other Agri-culture		Other Manufacture: Domestic		Other Manufacture: Export		Mining and Construction		Trade and Transport		Infrastructure & other services		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0.1/1.3	Professional, technical and related workers	– / .01	– / –	– / –	– / –	.04 / .02	.02 / .01	.03 / .01	– / –	.01 / –	.09 / –	.02 / .03	.01 / –	.18 / .92	.53 / .99	100	100
2	Administrative and managerial	– / .09	– / .02	.01 / .06	– / .02	.03 / .12	.01 / .18	.04 / .10	– / .20	.01 / .02	– /	.03 / .24	.01 / .17	.01 / .38	– / .42	100	100
3	Clerical and related workers	.02 / .03	– / .02	.02 / .02	.03 / .02	.06 / .03	.10 / .04	.03 / .02	.03 / .07	.04 / .02	.82 / .01	.27 / .31	.59 / .17	.11 / .57	.26 / .68	100	100
4	Sales workers	– / –	– / –	– / –	– / –	.03 / .11	.01 / .04	.01 / .03	– / .06	– / –	– / –	.07 / .56	.24 / .87	.01 / .30	– / .03	100	100
6	Agriculture	.74 / .75	.99 / .87	.74 / .13	.94 / .10	.04 / –	.03 / –	– / –	– / –	– / –	– / –	.01 / –	.03 / –	.09 / .11	.04 / .02	100	100
7.0/7.9	Production Workers	.09 / .45	– / –	.15 / .12	.02 / –	.16 / .10	.35 / .08	.24 / .11	.85 / .90	.04 / .02	– / –	.01 / .01	– / –	.03 / .19	.01 / .01	100	100
8.1/9.5	Fitters and Craftsmen	.04 / .19	– / –	.01 / .01	– / .06	.23 / .13	.01 / .16	.23 / .10	.01 / .32	.41 / .19	– / –	.08 / .10	– / –	.06 / .29	.01 / .46	100	100
5	Service Workers	.02 / .06	– / .01	.01 / –	– / –	.04 / .02	.01 / .01	.03 / .01	– / .02	.02 / .01	– / –	.08 / .07	.04 / .04	.20 / .83	.10 / .91	100	100
	Others	.09 / .13	– / .02	.05 / .01	– / –	.37 / .07	.46 / .36	.36 / .05	.10 / .35	.48 / .07	.09 / –	.42 / .16	.07 / .04	.31 / .52	.05 / .23	100	100
	TOTAL (All categories)	100 / .34	100 / .41	100 / .06	100 / .05	100 / .04	100 / .04	100 / .03	100 / .20	100 / .04	100 / –	100 / .09	100 / .03	100 / .41	100 / .26	100	100

SOURCE : Central Statistical Office

Beginning with the factor accounts in row 1-8, we note that wages and salaries accounted in 1974, for 42 per cent of factor income while 55 per cent came from profits, including the profits of incorporated enterprises.[1] One-third of the wages and salaries and about two-thirds of the profits came from the sugar industry. The sugar industry employs three-quarters of the agricultural male labour force and virtually the whole of the agricultural female labour force.[2] For the purpose of the analysis of income distribution, we have equated the sugar industry with the rural sector and the rest of the economy with the urban sector. This is not strictly correct as the large majority of the labour force employed in other agricultural activities also belong to the rural sector. But altogether they only represent 13 per cent of the total agricultural labour force.[3] The sugar industry is the predominant source of rural income, while virtually the whole of the income arising in the rest of the economy accrues to the urban households. The distinction between the urban and rural households in the context of the SAM has important policy connotations being given the significance of urban-rural differentials as a major determinant of income inequality in developing countries.[4] In Table 30(i) row 9, the term "sugar" households denotes those households which derive the bulk of their income from the sugar

industry/....

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1. The difference of about 3 per cent represents the income derived from the ownership of dwellings (income from owner-occupied houses).
2. Information obtained from the employment Matrix Tables 30(ii) and (iii).
3. These figures are based on the information in Table 30(iii) and relate to employment in large establishments only.
4. G Pyatt and A R Roe: op.cit. Ch 3, p.56. See also H Chenery "et al": Redistribution with Growth: O.U.P. (1974) pp 19-21.

industry, either as labourers or cane planters or both. The Table shows that over ninety per cent of the income of these households comes from the sugar industry. Similarly the term "non-sugar" households applies to households which derive the largest part of their income outside the industry.

Turning now to the source of factor income, we see that urban (i.e. non-sugar) labour draws nearly one-third (30 per cent) of its wages and salaries from Government employment, while Government employment is only a marginal source of income for rural households.[1] The first six columns of Table 30(i) show the manner in which factor income accrues to various institutions. Households draw 57 per cent of their income from labour, 4 per cent of their income from the ownership of dwellings and 21 per cent from unincorporated enterprises. Thus 25 per cent of the factor income received by households accrues from the ownerships of non-labour factors.

We may once again differentiate between urban and rural households with respect to the sources of income.
Rural households derive 62 per cent of their income from labour services, while urban households derive 55 per cent of their income from that source.[2] Thirty per cent of rural income and 18 per cent of urban income comes from unincorporated enterprises

(excluding/...

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1. Following our distinction between urban and rural labour in terms of occupation rather than location, and from the detailed Central Statistical Office classification of employment by occupation, industrial group and sex for March 1977, from which the Employment Matrix for 1974 is derived (Tables 30(ii) and 30(iii)), it appears that only 8 per cent of the agricultural (rural) labour force was employed by Government.
2. In the case of a wage economy like that of Mauritius, the difference between the sources of income of urban and rural households is not as pronounced as it would be in an economy with a large subsistence sector.

(excluding dwellings). As we shall see later the effect of wage increases on household income depends to a large extent on the source of these incomes and the extent to which they are derived from wages and salaries, rather than from self-employment or distributed profits.

Besides labour and other factor income, households receive income in the form of distributed corporate profits and transfer payments. In 1974, these inter-institutional transfers amounted to 16 per cent of total household income. If, following the occupational classification of households between urban and rural, we define urban households as those institutions which obtain most of their income from urban occupations, we can argue that the whole of the distributed profits of companies accrue to urban households which, it would appear also receive the largest share of the Government transfer payments. This conforms with the findings in other countries.[1]

The sources of household income (including that of unincorporated enterprises) and corporate income can be obtained from rows 9 to 12 of Table 30(i). These figures show that the sugar industry provided about 50 per cent of the income of households and firms.

Turning now to the Government current account (in rows and columns 13 and 14), we note that sugar provided forty-two per cent of Government current revenue in the form of direct taxes, import duties and other transfer payments.[2] The difference

between/....

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1. G Pyatt and A R Roe: Op.cit. Ch 3, p.61.

2. The amount of direct taxes paid by households and firms, Rs 77 million and Rs 75 million respectively, are in both cases the actual amount received by Government under each head in 1974. But these taxes are levied on the previous

between the share of income received by the sugar industry and its contribution to the Government revenue is explained by the existence of a time lag between the receipt of income and the payment of tax thereon.

The Combined Capital Account

The entries in rows 15 and 16 of Table 30(i) record the various sources of savings. All these figures have been covered before except for the entries relating to the amount of corporate savings by sugar and other companies. In the total figure of 771 sugar companies accounted for 673 and other companies for 97. These amounts were obtained in the usual manner as the difference between the income of the companies and their expenditure. By dividing the amount of savings by the corresponding income, we obtain the firms' average propensity to save. The data show that the sugar companies saved 80 per cent of their income in 1974, while other firms saved 34 per cent of their income.[3]

The Production/...

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year's income. There is a one-year lag between the distribution of income and the payment of tax. During a period of economic stability the effect of the time lag may not be very important. But 1974 was an exceptional year and the delay between the assessment and payment of income tax creates a distorted picture of the pattern of income utilisation in the economy and especially of the importance of Government fiscal policy on the redistribution of income. On an accrual basis, the amount of income tax payable by households and firms on their 1974 incomes, which were paid the following year, was Rs 117 million and Rs 292 million respectively.

3. This is subject to the proviso regarding the difference between the tax liability of households and firms in respect of income received in any year and the amount of tax paid by them in that year. If we consider the amount of accrued tax payable by sugar companies on their 1974 income, the rate of saving of sugar companies net of the accrued tax liability, drops to 58 per cent. The figure of 58 per cent was obtained as follows: the difference between the accrued tax liability and the actual amount of tax paid in 1974 (i.e. 217), was apportioned between sugar and non-sugar firms in the ratio 85 to 15. This reduced the savings of sugar companies to 489 (about 58% of their income) and of other companies to 65 (or 23% of their income).

The Production Accounts:

The production activities are shown in detail in Table 31. A condensed version is incorporated in Table 30, in which the thirty Production accounts are aggregated into eight accounts, reflecting the main sectors of economic activity in the Island. They consist of the sugar industry, other agriculture, other manufacturing - for the domestic market and for export - and the following non-tradeable or service sectors: construction, trade and transport and infrastructural and other services. With the inclusion of production activities in semi-disaggregated form, Table 30(i) provides a more complete picture of the structure of the local economy and the contribution made by sugar and other industries to output and income. The Gross output of the production activities totalled 5892[1], of which sugar contributed 54 per cent, while the production of other commodities (other agriculture and manufacturing) added 14 per cent and infrastructure and other services 32 per cent of the total output. These figures reveal the predominance of the sugar industry over all other forms of production activity in the Island.[2]

Table 30(i) also differentiates between domestic and export manufacturing. The significance of this distinction resides firstly in the fact that these export industries are of considerable strategic importance for the island's development and secondly,

in the/....

1. In the Input/Output matrix, (Table 31), the Gross Output of the production sector amounts to 5885, the difference of 7 being caused by differences in the estimated increase in stocks:178 in the Input/Output matrix and 185 in the SAM. In the Input/Output matrix stock changes are used as a balancing figure, equal to the difference between the estimated Gross Output and Total Sales. In the SAM they are obtained as a residual equal to the difference between the estimated total amount of savings and other investment expenditure.
2. It may be necessary to repeat that these data relate to 1974, when the value of sugar sales reached a record amount.

in the rapid progress of export industrialisation in the Island after 1970.[1]

Another interesting aspect of the information relates to the disposal of the output of the production activities. Reflecting the highly specialised nature of the Island economy and the under-development of the domestic manufacturing sector, final sales to households and exports accounted for the bulk of commodity production (98.9 per cent in the case of sugar and 79.7 per cent in the case of other manufacturing activities.) On the other hand, intermediate sales claimed a much greater proportion of the total output of trade and transport (50 per cent).

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The network of intersectoral transactions shown in the SAM reveals some interesting analytical paths we would now like to follow briefly. Where intermediate sales claim a relatively high proportion of the output of a commodity or service as is the case with trade and transport, this implies that an increase in the cost of these services will, other things being equal, have a relatively more important effect on the level of costs and prices, production and employment, in other sectors than cost increases in the sugar industry and other manufacturing industries.

It further implies that the general level of economic activity will have an important influence on the level of demand in these sectors, hence on the possibility for them to absorb an increase

TABLE 31/...

1. G Pyatt and A. R Roe: Social Accounting for Development Planning: Op.cit. Ch 3, p.55.

TABLE 31 The Disaggregated Matrix of Inter-Industry Transactions and Imports, 1974 (Rs 000)

INTERMEDIATE CONSUMPTION

	1 Cane	2 Planters	3 Foodcrops/ Other Crops	4 Tobacco	5 Tea	6 Livestock & Fishing	7 Ancillary Agric. Activities	8 Mining & Quarrying	9 Sugar, Scum, Molasses	10 Other Foods	11 Clothing, Textiles, Footwear	12 Wood, Cork, Wood Products	13 Paper Products, Packaging	14 Chemical Industries	15 Non-Metallic Mineral Products	16 Metal & Electrical Products	17 Other Industries	18 Electricity	19 Water	20 Construction & Public Works	21 Trade (W&R)	22 Hotels & Restaurants	23 Passenger Transport	24 Goods Transport	25	26 Telecommunications	27 Banks, Insurance, Legal, Business	28 Service Industries	29 Garages & Workshops	30 Dwellings
1 Cane (S.E.W.F.)									968931																					
2 Planters									439400																					
3 Foodcrops/Other Crops											479	751										750								
4 Tobacco										5986																				
5 Tea										13900																				
6 Livestock & Fishing										9794												750								
7 Ancillary Agric. Activities	1949	1580																												
8 Mining & Quarrying						9								18	1920					1140										
9 Sugar, Scum, Molasses	1989	5000											850					1453												
10 Other Foods						2000			130													10000								
11 Clothing, Textiles, Footwear					135			70	3587										31			250		300	400					
12 Wood, Cork, Wood Products								120				800								3227		890								
13 Paper Products, Packaging	1448								592	3214	600								27	1157	2800	280			69	800				
14 Chemical Industries	3727	2485			1200											1096				9110		250	4092	1935					339	
15 Non-Metallic Mineral Products																				35247										
16 Metal & Electrical Products																491				30743			1339	1038					8354	
17 Other Industries																														
18 Electricity	2661	417	100	85					2436	2676	036	101	266	1367	776	760	94		1127	730	5562	2200		750	250	77	300	900	2650	
19 Water																														
20 Construction & Public Works	4560								1957										189		2400			1000	451				1000	5566
21 Trade (Wholesale & Retail)	8358	5000	1104	80	215	2155		80	1219	12862	6391	1902	2150	5026	417	5050	1500	1783		43047	934	3550	3866	6079	1200	8	2000	6147	25365	
22 Hotels & Restaurants																														
23 Passenger Transport					200					1380	500	100	300	540	365	350	192			1000	2400	600	490			955	2200	600	658	
24 Goods Transport		25000	759	175	750			40		7135	1200	450	475	800	10000	1700	125	1610	941	22000	3650	550		2000	14965	1570				
25 S.E.W.F. Transport	44365								49888																					
26 Telecommunications	378									200	315	8		90	50	138	15	14	44		2600	1200		250		127	300	400		
27 Banks, Insurance, Legal, Business	-380								4094										2163	10000	15000		1500	2500	17187					
28 Service Industries	3862	1779							1699													450								
29 Garages & Workshops	3830								1289	6311	3458	336	371	1242	1200	916	596	377	4882		10000	1000	13501	38587	6382	19	400	1067	2000	
30 Dwellings																														
Unallocated Expenditure		5466																		1711	5622									
							(1130)																							
Σ Intermediate Cons. (Local)	77247	46727	1963	340	2500	4164	1130	310	148677	73591	14029	4448	4412	9083	14728	10501	2522	5237	9404	159112	50862	22720	24788	54240	40835	2825	6000	9114	40361	5560

IMPORTS

31 Foodcrops			1121							6295	1239			304																
32 Livestock & Fishing										6372																				
33 Other Foods						12948				146678												40000								
34 Cloth, Textiles & Footwear						536			1085		62156						618											1214		
35 Wood, Cork, Wood Products										225		7644								9233										
36 Paper Products, Packaging										2527			13286						68	540	3640				476	4466	2128			
37 Chemical Industries	31882	22515	4541	819		101		80	2100	1596	1587	147	655	25398		123				19989	1301						9269	914		
38 Tyres & Tubes																							3719	1778	1093					
39 Fuel & Lubricants	1870								1081						299			16319		961		640	15235	30765	4436	19			1828	
40 Non-Metallic Mineral Products	1871									6558					7580					39505	153							231	294	
41 Metal Products	1300	900						80		1344					450	19539	4929		867	95635		785			800			169	49207	
42 Electrical Products																27473													3033	
43 Other Industries																	22172					683								
44 Miscellaneous Services	5500	2700																					1890	17000				3700		
45 Duties & Taxes on Imports	985	558	286	71					438	9215	13925	659	1109	1321	430	1139	688	2027		7196	396	1650	9568	5318	845	81	518	1486	6740		(6860)
							(139)																							
				(-20)												(+50)	(-30)		(-99)				(+65)				(+500)		(-122)		
46 Σ Intermediate Cons. (Imports)	43406	26673	5948	870		13585	1139	160	4654	180808	80907	8449	15050	27018	8759	48324	28377	18346	836	173059	5490	43758	30477	54861	7174	526	5484	16383	6308	
Σ Σ Intermediate Cons.	120655	73400	7911	1210	2500	17749	2269	470	153426	254391	94936	12897	19462	36101	23487	58825	30899	23583	10240	332171	56358	66478	55265	109101	48009	3351	11484	26097	103469	5565

FINAL SALES

	Σ Intermediate Consn	31 Final Cons H-holds	32 Final Cons Govt	33 Exports	34 GDCF H-holds	35 GDCF Firms	36 GDCF Govt	37 Change in Stocks	38 Total Sales	39 ΣΣ
1 Cane (S.E.W.F.)	968931									968931
2 Planters	439400									439400
3 Foodcrops/Other Crops	1980	50794		290					51084	53064
4 Tobacco	5986									5986
5 Tea	13900									13900
6 Livestock & Fishing	10544	39796		3481					43277	53821
7 Ancillary Agric. Activities	3529									3529
8 Mining & Quarrying	3120	1100							1100	4220
9 Sugar, Scum, Molasses	19392	13100		138091				166708	176288	782278
10 Other Foods	12150	158957	1000	69410				4348	233711	245861
11 Clothing, Textiles, Footwear	4773	67944	1880	65009				4208	139041	143814
12 Wood, Cork, Wood Products	5037	13947		977					14924	19961
13 Paper Products, Packaging	10987	17706	1000	2093					20799	31786
14 Chemical Industries	24234	20297		3362				1551	25210	49444
15 Non-Metallic Mineral Products	35247									35247
16 Metal & Electrical Products	41965	33375		49256					59941	101906
17 Other Industries		10244		25953				1026	37223	37223
18 Electricity	27371	26405	3192	3208					32806	60176
19 Water										
20 Construction & Public Works	17122		31626		163000	191000	86000		471626	488748
21 Trade (Wholesale & Retail)	147986	143336	1800	1900		25555	3000		175581	323567
22 Hotels & Restaurants		10166	150	105600					115916	115916
23 Passenger Transport	12827	79212	4778	32690					116678	129502
24 Goods Transport	95895	42138	1200	31410					74748	170643
25 S.E.W.F. Transport	94253									94253
26 Telecommunications	6129	7354	1632						8986	15115
27 Banks, Insurance, Legal, Business	51864	18135	9362	3000					30497	82361
28 Service Industries	7790	109764	3100	50700					163564	171354
29 Garages & Workshops	109295	24000	1831	3700					29531	138826
30 Dwellings		85565		5000					90565	90565
Unallocated Expenditure	12699									12699
	(130)									(1130)
Σ Intermediate Cons. (Local)	2185586	943396	62546	2040120	163000	223858	89000	177858	3699678	5885226
31 Foodcrops	8959	24822	1409						26231	35190
32 Livestock & Fishing	6372	52159	5934						58093	64465
33 Other Foods	199626	228268	36592						264860	464486
34 Cloth, Textiles & Footwear	65609	22806	1965	1847				44084	75302	140811
35 Wood, Cork, Wood Products	17100		1058					1238	2296	19396
36 Paper Products, Packaging	27131	5227	840	241				1089	7397	34528
37 Chemical Industries	123012	19087	4687	208				8000	31982	154994
38 Tyres & Tubes	6590	1143	516	220				-355	1529	8119
39 Fuel & Lubricants	73408	17181	3400	62519					83050	156453
40 Non-Metallic Mineral Products	56192	2446	552	89					30087	59279
41 Metal Products	176005	20451	6285	6160		10595	9464		148275	324280
42 Electrical Products	50506	43578	437	1291		6018	5078		110542	141048
43 Other Industries	24855	8428	1083	357				1607	11475	34380
44 Miscellaneous Services	30790	131200	23700						154900	185690
45 Duties & Taxes on Imports	75458	69667		5245		14459			84571	160029
	1139									1139
	6969									6969
46 Σ Intermediate Cons. (Imports)	928066	549038	88458	78182		180737	14527	10643	1062446	1991550
Σ Σ Intermediate Cons.	3118596	1584244	151004	2118302	163000	404592	103587	288496	4762124	7876776
Compensation of Employees	930199	15000	252000						267000	1197199
Income of Unincorporated Ents.	526950									526950
Gross Profit	1142640									1142640
Value Added	2599789	15000							267000	2866789
Indirect Taxes/Subsidies	171841									171841
GROSS OUTPUT	5885226	1599244	403004	2118302	163000	404592	103587	288496	5080181	10915406

in wages and other costs. Generally where there exists substantial intersectoral linkages, any measure taken in a particular sector may have important effects on other sectors and proper attention must be given to this fact for purposes of planning and policy.

On the other hand, where, as in the case of the sugar industry and some other export industries - tea and electrical products - the value of exports represents 80 per cent or more of total sales - virtually 100 per cent in the case of export processing industries - local firms have no control over the prices of their product, which are determined by world market conditions. In these cases the effect of an increase in wages will be to reduce production and employment, the reduction being greater, the greater the wage component of the final product and the greater the elasticity of demand.[1] In contrast, in the non-tradeable sectors: construction, trade, transport and services, where there is, by definition, little or no external competition, local firms have a much greater discretion with regard to the fixing of prices; they are price makers and to the extent that they can pass on the higher wage costs to consumers in the form of higher prices, wage increases may have little effect on production and employment.

In our study of the effect of wage increases on prices and income, we shall assume that in the case of sugar, tea and electrical product industries, which export over 80 per cent of

their/...

1. B J Knight: Wages and Zambia's Economic Development: Op.cit. pp.101-103.

their production on the world market, prices are fixed to the producers, in which case any increase in production costs must be absorbed by a reduction in the operating surplus; in all other cases we assume that the increases in wages and costs can be passed on to consumers in the form of higher prices.

*****

Wage Increases and External Competition

Our objective in this chapter is to investigate the structural constraints and limits to Government wage policy and our main concern has been to analyse, more precisely to develop a macro-data framework for the analysis of the impact of Government wage policy on the economic system. This provided the fundamental motivation behind our attempt to construct a Social Accounting Matrix for Mauritius and the extensive investigation into the Island social accounts which it involved. The need for an information system, based on the generalisation of input-output techniques, is indispensable for a proper investigation of the relation between wages, prices and incomes, the level of output, Government finances and the Balance of Payments in order to take into account the indirect or "hidden" effects of changes in one or other of these variables. From what has been said above it is clear that wage increases will have different effects on production and prices in different parts of the economy. What remains for us to do is to use the framework that we have developed to investigate the constraints set by the world environment on the local economy. We propose to do this in the first place by considering the importance of wage costs in total costs and the 'degree of external competition.

We first/...

We first consider the importance of external competition. Following Knight, external competition is measured here in terms of the imports of final product plus total exports expressed as a proportion of domestic production or value added.[1] Knight calls this the index of external competition. This index indicates the degree of competition, hence the degree of control of domestic producers over the price of their product.[2] This in turn indicates the likely effect of wage increases on

the level/...

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1. We define external competition as the share of imports in domestic consumption of various commodities and the share of local production that is exported. The local producers face competition in both the domestic and export markets. In his analysis of the effect of wage increases in the Zambian economy, Knight draws a distinction between goods and services produced mainly for export and those produced mainly for sale to local markets. In the latter case he also distinguishes between those subject to, and those free from, foreign competition. Local producers have little control over export prices, in which case the effect of higher wages is to reduce production (and employment), the reduction being greater, the greater the elasticity of supply. Similarly, the elasticity of demand for a commodity on the local market will be greater, the greater the share of imports. (B J Knight: Wages and Zambia's Economic Development: Op. cit. p.101).

2. The greater the degree of competition, the greater the number of producers and the number of available substitutes for a commodity, the lesser the degree of control of producers over the price of their product. At one extreme in perfect competititon, there are a large number of producers; the commodity is homogeneous, one unit anywhere in the market being a perfect substitute for another unit. A producer in that case has no control over the price of his product. At the other extreme, in monopoly, there is one producer and for all practical purposes no substitutes, and the producer can alter the price of the commodity at will by changing the quantity supplied. Most firms however, operate in imperfectly competitive markets, most commodities have more or less close substitutes, hence most producers have greater or less control over the price of their product. These substitutes can be locally produced or imported and to that extent, the share of imports in that market will determine the degree of control which local producers have over the price of their commodities in the domestic market. Likewise the greater the percentage of local production which is exported, the lesser the degree of control of local producers over their price.

the level of employment and production in the industry concerned. Thus the greater the degree of competition, the more elastic the demand for the commodity, the greater "ceteris paribus" will be the drop in output following a given increase in wages. On the other hand, the more inelastic the demand, the smaller will be the reduction in output, and the greater the increase in price, for the same increase in wages.[1] Table 32 below shows the wage component of costs and the index of external competition for a selected group of products and activities.

The overall index of external competition is 1.03, and this confirms what is a well-known fact, namely that Mauritius has an extremely open economy in which imports claim a predominant share of the domestic market for most manufactured products, and where, by contra, the bulk of domestic production must be exported. These figures reveal the constraints imposed by the Island's situation of economic dependency - the small size of the domestic market and its lack of cohesiveness - on an industrialisation policy. It also gives substance to Meade's assertion that in Mauritius the general level of money prices is set by the outside world economy. On the other hand in services and construction, local firms enjoy a strong geographical protection from imported products. In these cases, they could, in theory, pass on wage increases to their customers in the form of higher prices. The smaller the price elasticity of

demand,/...

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1. For all categories of commodity, there is a lesser upward movement of the supply curve, the greater the elasticity of substitution of other factors for labour in response to the increased relative price of labour: with high elasticity the main effect is on employment rather than production or prices. B J Knight: Op.cit. p.103.

TABLE 32 : The Wage Component of Costs and Index of External Competition - 1974

	Earnings per employee Rs per day	Direct wage costs as % of total costs	% change in price*	Index of external competition
Tradeable sector				
Sugar cane	10.37	20	23	
manufacture		3.5	23	1.2
Other commercial crops (tea and tobacco)	6.61	55	58	1.6
Foodcrops		28	29	0.6
Livestock and fishing	8.49	03	05	1.7
Other food, beverages and tobacco	7.77	11	16	2.7[1]
Textiles, clothing and footwear	4.72	14	16	1.9
Wood, cork, wood products		18	25	0.3
Paper products, printing and packaging	10.76	22.5	26	0.7
Chemical and rubber	5.98	8.5	15	8.6
Fuel and lubricants				
Metal & electrical products	9.56	7	7	2.96
Travel and Tourism				4.67[2]
Merchant Shipping				
Non-tradeable sectors				
Electricity and water	8.26	32	34	0.0
Garage and workshops	6.49	14	23	0.0
Constructions	12.69	24	33	0.0
Trade	8.47	33	36	0.0
Local transport	6.30	22	35	0.0
Banks, Insurance and legal services	11.41	36	8	0.3[3]
Other Services		26 n.g.	27 n.g.	0.0
		63 w.g.	63 w.g.	0.0
TOTAL	9.04	16	24 n.g.**	
		19	28 w.g.	1.03 w.g.***

* following a doubling of wages
** without government
*** with government

1. Includes sales to hotels and restaurants.

2. Imports and exports of services connected with tourism (passenger fares and travel expenses) divided by the value added of airline companies, travel agencies, domestic shipping (passengers), and hotels and restaurants.

3. The value of imports and exports of insurance services alone divided by the value added of Banks and insurance companies. It does not include the value of imports and exports of banking services for which we have no information.

demand, the smaller the effect on output and employment and the greater the effect on price of a given wage increase. Clearly then an increase in wage costs will have different effects on production and prices depending on differences in the elasticity of demand for each commodity. In an extremely open economy like Mauritius, the elasticity of demand will depend on the degree of external competition.

Table 32 also shows (i) the direct wage costs as a percentage of total costs and (ii) the percentage change in price. If we want to analyse the total cost effect of a general wage increase throughout the economy, we must consider not only the direct labour costs but the indirect costs as well, i.e. those labour costs which enter into the cost of intermediate goods.[1] Standard input-output techniques provide a ready way of quantifying those indirect or induced effects and we can thus determine the full effect on costs and prices of a given wage

increase/...

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1. Use of the input-output model "has the rather simple advantage that it gives a final equilibrium solution to the final price-raising effects prdlem by recognising the inter-dependence of industries and the fact that a price increase in one industry is likely to be a cost increase in some other. Writing

$$\Delta p = (1-A)^{-1} \Delta w$$

where p = vector of prices by industry
w = vector of wage costs per unit of output (by industry)
A = input-output coefficient matrix.

This equation shows the changes in prices resulting from changes in per unit wage costs.
CG Hayden,"et al". The Botswana Economy: Op.cit. p.7.

increase.[1]

Table 33 shows the coefficient matrix of interindustry transactions. From the table we calculate the value of indirect wage costs by multiplying the inputs of intermediate goods used by each industry, expressed as a percentage of total costs, by the wage component of the cost of these intermediate goods. The indirect wage costs of each production activity are also shown in the Table (the figures between brackets).

The coefficients matrix reveals the underlying structure of production. It shows also the relative importance of imports in manufacturing activities (accounts 10 to 17), where imports averaged 50.6 per cent of the total costs of production. This contrasts with the primary producing sector (1-5) where they accounted for only 9 per cent of costs on average, and infrastructural and other services where imports represented 33 per

cent/....

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1. The full effect on cost of a given wage increase was calculated by solving the following equation. (for all industries):

$$x_i = \alpha_i w_i + \sum_{j=1}^{n} \beta_{ij} x_j$$

$$(i = 1, \ldots n \; ; \; i \neq j)$$
$$j = 1, \ldots n$$

where x_i = the percentage increase in total cost of the ith industry.

α_i = the wage component of total cost of the ith industry

w_i = the percentage increase in wage cost, here assumed to be 100 per cent.

β_{ij} = the cost to the ith industry of intermediate goods from the jth industry, as a proportion of total costs, on the assumption that the prices of intermediate goods increase by the same percentage as their total costs.

B J Knight. Op.cit. p.105.

TABLE 33

Total Cost Effect of Wage Increases: Direct & Indirect Costs of Wage Increases: 1st & 2nd Rounds of Iteration

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1									.543																					
2									.25																					
3											— .003	(.011) .04										(.002) .006								
4										(.005) .018																				
5										.044																				
6										— .031												— .006								
7	— .002	(.001) .004																												
8															(.029) .05					(.001) .002										
9	— .002	— .011				(.003) .037				.032								(.001) .002												
10					(.001) .009			(.002) .017	— .002										—			(.008) .086			— .004					
11								(.005) .028				(.007) .04								(.001) .007		(.001) .008								
12	— .001									(.002) .010	— .004									— .002	— .009	— .002				— .005				
13	— .004	— .006			(.003) .086											— .011				(.002) .019 (.010) .072		— .002	(.003) .031	— .011			(.001) .010		— .002	
14																														
15																— .005				— .063			— .010	— .006					— .060	
16																														
17	— .003		— .002	(.004) .014					— .001	(.002) .008	(.002) .008	(.001) .005	(.002) .008	(.003) .023	(.006) .02	(.002) .007	— .003		(.011) .040	— .001	(.005) .017	(.006) .019		(.001) .004	— .003	(.001) .005	(.001) .004	(.001) .005	(.006) .019	
18																														
19	(.001) .005																		(.002) .007		(.002) (.007)									
20	(.005) .009	(.004) .011	(.007) .02	(.004) .013	(.004) .016	(.013) .040		(.006) .019	.001	(.013) .040	(.015) .044	.03	(.02) .068	(.03) .102	(.004) .012	(.017) .050	.04	(.010) .03		— .029		(.010) .031	(.010) .030	(.001) (.012) .036	(.001) (.004) .012		(.008) .024	(.012) .036	(.060) .182	
21																														
22					(.004) .014					(.001) .004	— .005	(.002) .005	(.001) .009	(.003) .011	(.003) .010	— .003	(.002) .006			— .002	— .008	(.002) .005	(.001) .004			(.019) .065	(.008) .027	(.001) .004	(.002) .005	
23																														
24		(.013) .057	(.008) .014	(.006) .029	(.012) .054			(.002) .009		(.005) .022	(.002) .008	(.005) .023	(.008) .015	(.004) .016	(.062) .28	(.004) .017	— .003	(.007) .03	(.007) .034	(.010) .045	(.002) .011	(.001) .005		(.008) .012	(.035) .16	(.029) .104				
25	(.015) .046								(.09) .028																					
26											— .002			— .002		— .001			— .001		(.003) .008	(.004) .010		— .001		(.003) .008	(.002) .004	— .002		
27									— .002										(.027) .077	(.007) .020	(.017) .046		(.004) .012	(.005) .013	(.065) .18					
28	(.001) .004	(.001) .004																				(.001) .009								
29	— .004								— .007	(.003) .020	(.003) .024	(.002) .017	(.002) .012	(.004) .028	(.005) .054	(.001) .009	(.002) .016	— .007	.17		(.004) .031	(.004) .009	(.014) .10	(.032) .23	(.010) .063	— .001	— .005	— .006	(.002) .014		
30																														

		TOTAL
ZIC % Local	.08 .11 .037 .057 .18 .077 .32 .073 .83 .23 .10 .22 .14 .18 .42 .10 .068 .10 .34 .33 .16 .20 .19 .32 .43 .187 .073 .058 .29 .06	
ZIC % Imported	.04 .06 .11 .145 — .25 .32 .088 .005 .57 .56 .42 .47 .55 .25 .47 .76 .35 .030 .55 .017 .38 .24 .32 .08 .035 .067 .10 .45 —	
Comp. % Imported	.18 .25 .28 .26 .67 .030 .30 .57 .055 .09 .14 .18 .23 .09 .15 .075 .093 .29 .39 .24 .35 .15 .30 .22 .35 .47 .36 .26 .14 — .24	
Indirect Wage Costs	x .02 .02 .01 .014 .029 .016 — .016 .01 .08 .022 .058 .028 .051 .109 .024 .017 .018 .071 .066 .038 .039 .032 .054 .115 .046 .019 .014 .096 .014 .04	
	xx .005 .005 — .001 .007 .003 — .002 .005 .004 .005 .008 .003 .003 .018 .005 .003 .001 .006 .008 .005 .001 .012 .024 .017 .008 .005 .001 .008 .004 .007	
Dir. & Indir. % Wage Costs	.21 .28 .29 .27 .70 .05 .30 .59 .05 .124 .16 .25 .26 .15 .28 .10 .11 .31 .47 .31 .37 .19 .34 .30 .46 .52 .38 .28 .24 .018 .28	

x First Round of Iteration

xx Second Round of Iteration

Figures in Brackets = Indirect Wage Costs, First Round of Iteration

T A B L E 3 3 (i) : Indirect Costs of Wage Increase

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1																														
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9		.002											.004					.005												
10						.002																.005								
11																														
12								.002				.002	.002																	
13																														
14					.004																		.002							
15																				.008										
16																				.002								.001		
17																														
18																														
19																														
20																														.004
21						.001				.001	.001	.003	.002	.003		.002	.001			.003		.001		.001				.001	.006	
22																														
23																										.002				
24		.003		.001	.003					.001		.001			.015			.002	.002	.002					.009	.006				
25	.005								.003																					
26																														
27																											.003			
28																														
29										.002	.002	.002	.001	.002	.003		.002		.016		.003		.007	.022	.007				.001	
30																														
TOTAL	.005	.005		.001	.007	.003		.002	.003	.004	.003	.008	.007	.005	.018	.002	.003	.007	.018	.015	.003	.006	.009	.023	.019	.008		.001	.008	.004

cent of total costs.[1] The fact that imports and exports account for such a large proportion of total output reduces the scope that exists for wage increases within the production sector.[2]

The greater the importance of intermediate inputs in production, the smaller the contribution of labour and other primary inputs. Thus, the labour component of the final product is relatively high in agriculture (28 per cent on average) compared with manufacturing industries where it averaged 13 per cent. These differences in the cost structure of different activities have important implications with regard to the effect of wage increases on production and prices in different parts of the economy.

As mentioned above, the lack of computer facilities prevented us from determining the final effect of wage increases on costs and prices. On the other hand it appears that the "first-round" indirect costs of wage increases in turn lead in most cases to negligible further costs when multiplied by the constant coefficients of the matrix. The results obtained by iteration thus closely approximate to the results that would have been obtained by the inversion of the matrix.[3] Following this

procedure/....

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1. In 1976 wages and salaries represented 34.8 per cent of the value of agricultural production, 44% of the/value of cane cultivation (millers estates and planters combined) and 8.6 per cent of the value of sugar manufacture compared with 28 per cent, 20 per cent and 3.5 per cent respectively in 1974.

2. In the case of Puerto Rico, according to Reynolds and Gregory, money wage increases have only a limited impact on the aggregate demand for locally produced goods and on insular employment. Much of the demand effect leaks out to the mainland economy. The same openness implies that prices of finished goods are given to Puerto Rico so that internal inflation is not a feasible way of adjusting to money wage increases. Thus wage changes operate mainly on employment of the categories of labour involved and macro-economic effects are of a lower order of importance. This reduces the urgency of estimating the total effect of a wage change and permits one to concentrate only on the direct effects. L G Reynolds and P Gregory: Op.cit. Ch 3, pp.82 and 83.

procedure we have calculated the percentage change in costs and prices that would result from a general doubling of wages.

The results show that costs would rise on average by twenty-eight per cent but with considerable variation between different activities. The percentage increase is relatively high for tea and other commercial crops (sugar cane[4] and tobacco) and relatively low for livestock and fishing and other small scale agricultural enterprises. It varies between 16 and 28 per cent in manufacturing. It is relatively high in all services, especially in the professional services and trade and transport which are often characterised by surplus capacity (trade and transport) and where the labour/output ratio tends to be correspondingly high. Where wage costs represent a relatively important proportion of the total costs, as in the case of tea, sugar and services, production, prices and profits will be relatively more sensitive to wage increases than in those sectors where wage costs are a small proportion of total costs.

We have seen above[5] that those industries which face a strong external competition either in the domestic or export market will not be able to pass on the cost increases to their customers in the form of higher prices. In that case the whole of the cost increases will have to be absorbed by a fall in gross profit. The effect on gross profit when wage increases are wholly absorbed, and not passed on as price increases, is shown below:

TABLE 34/...

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3. See C Hayden, "et al": Op.cit. p.11.

4. When we talk of the relatively high labour costs in the sugar industry, we refer to the normal conditions rather than to the 1974 ones. See above Chapter 2, page 100.

5. See page 253.

TABLE 34 : Reduction in Gross Profits for those industries which Produce an Export Commodity (Industries Where Exports Represent 80% or more of final sales)(Rs: 000).

100% wage increase in all sectors

Production Activity[1]	Original Gross Profit including depreciation	Fall in Gross Profit	% fall in profit
1. Cane s.e.w.f.[2]	601714	203475	33.8
2. planters[3]	224917	123032	54.7
5. Tea	2100	9869	470
9. Sugar and molasses[4]	185317	83767	45.2
11. Clothing and textiles[5]	22065	10592	48.02
16. Metal and electrical products[6]	35035	10394	29.6
17. Other industries	2596	4206	162.0

1. For all other activities it is assumed that prices increase to absorb the increase in wage costs, i.e. the increase in costs is fully passed on to the domestic customers.
2. The price paid by factories for cane is linked to the price of sugar which is fixed by international agreement or the world market.
3. Includes income of unincorporated enterprises.
4. Excludes increases in the cost of cane delivered to the factories. As the price of cane is linked to the price of sugar, we have assumed that wage increases in cane production are borne entirely by planters.
5. In the case of Clothing and Textiles, the price to producers is assumed to be fixed for that part of output which is exported.
6. Contains a miscellaneous collection of products ranging from bus bodies and iron bars to condensers and capacitors.

These/...

These results show that in the conditions of 1974, tea was a relatively marginal industry with a gross profit rate of 15 per cent and could not withstand any substantial increase in wages. On the other hand with the exceptional conditions prevailing in the sugar industry, sugar estates were in a strong financial position and could have absorbed a substantial increase in wages both in field and factory. With regard to the manufacturing industries although labour costs in clothing and textiles were not exceptionally high (14 per cent of gross output) profit margins were low reflecting the highly competitive prices for these products on export markets and their high import content. These industries could not therefore sustain more than a modest increase in wages. The same applies to Other Industries (diamond cutting and toys manufacture) where relatively little processing is done in Mauritius. On the other hand, with comparatively low labour costs and a large profit margin, metal and electrical products were in a much better position to face up to a substantial increase in wages.

We now proceed to analyse the effect of a doubling of wages on household income, Government net revenue and the Balance of Payments.

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Macro-Economic Implications of Government Wage Policy: An Analysis of the Effect of a Doubling of Wages on Household Income, Government Net Revenue and the Balance of Payments

A doubling of wages would result in a doubling of household income from labour services. In Table 30(i), household labour income amounted to 1197, of which 377 accrued to rural (sugar) households, and 820 to urban households. After a doubling of

wages,/..,

wages, household labour income would amount to 2394 (754 for rural and 1640 for urban households). We assume that the income of unincorporated enterprises has remained unchanged at 527. On the other hand, the operating surplus (gross profit) of firms will be affected by the wage increases, especially in the case of firms which cannot pass on the wage increase to consumers by way of price increase. Table 34 showed the reduction in the Gross Profit of export industries, following a 100 per cent increase in wages. For all other activities it is assumed that the wage increases are absorbed by an equivalent price increase and the increase in labour costs is thus fully shifted to the domestic customers.

In the SAM, part of the firms' income is transferred to Government (by way of taxes), part of it is distributed to households and the rest is saved. The reduction in firms' income, after the doubling of wages, will lead, it is assumed, to a proportionate reduction in the companies income tax.[1] It is also assumed that the firms distribute the same amount to households as before and that the reduction in profits leads to a corresponding reduction in the firms' saving. In that case, 250, as before, will be transferred by the firms to the households.[2] The estimated household income following the wage increase would be 3289, which is obtained as follows:

Income/...

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1. In what follows we assume that the income tax paid by both households and firms varies proportionately with changes in their income. From the available information we were unable to calculate the responsiveness of tax revenue to a change in income of individuals and companies, which would have given a more precise estimate of the change in tax.
2. Refer to tables 29 and 30(i).

Income of labour services	2,394
Income of unincorporated enterprises ..	527
Distributed profits of firms	250
Government transfers	86
Income from Rest of World	31
	3,289

The estimated income of firms, following the wage increases, would be 688, the difference of 445 representing the reduction in profits in the case of those industries which are unable to increase their prices (Table 34). Thus the doubling of wages would result in an estimated increase of 1197 in household income and a reduction of 445 in the income of companies.

We now proceed to calculate the disposable (after tax) income of households and firms, on the assumption that there is a proportionate increase or decrease in tax revenue in each case. In 1974, the accrued tax on household income was 117; it was 292 on firms' income.[1] Household income amounted to 2091 and firms' income to 1133. Thus the average rate of income tax was 5.59 per cent for households and 25.8 per cent for firms. Applying those rates to the estimated income of households and firms after the doubling of wages gives a tax of 184 for households and 177 for firms. By deducting these amounts from the estimated income of households and firms, we obtain the disposable income in eace case:

Households' new disposable income : 3289 - 184 = 3105

Firms' new disposable income : 688 - 177 = 511.

To obtain/....

1. See page 246 & p.247, footnote 2.

To obtain the net disposable income of households, we must deduct the estimated price increases - following the wage increases - from the figure of 3105. We give below, in Table 35, the value of household domestic expenditure at the new prices, on the assumption that the increase in price is equal to the increases in labour costs for all activities except sugar, metal and electrical products and other industries.

The original household expenditure on domestic goods and services amounted to 958.[1] The revised household expenditure will amount to 1182. Thus the estimated additional amount required by households to buy the same quantity of domestic goods and services at the new prices is 225. This gives an average price increase of 23.5 per cent. The disposable income of households, following the wage increase and net of price increases, will be 3105 - 225 = 2879.

From this amount we must deduct the estimated households savings. We assume that households have a constant average propensity to save as their income increases.[2] In 1974, household savings amounted to 320. This gives an average savings rate of $320^{3}/2093$ = 15.3 per cent. We used this figure to estimate the amount saved by households from their increased income. On this basis households would save 503 out of their disposable income of 3289.

TABLE 35/...

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1. See Table 31: This figure includes wages paid to domestic servangs amounting to Rs 15 million.
2. C Hayden "et al": Op.cit. p.14.
3. The figure for households savings in Tables 29 and 30(i) is 360. But the household income tax must be adjusted from the actual tax paid (77) to the accrued amount payable (117) and a corresponding adjustment made in households savings.

TABLE 35: Household Expenditure on Domestic Products at New Prices[1] (Rs 000)

Products	A/c No	Original Expenditure	Revised Expenditure
Foodcrops and other crops	3	50,794	65,524
Livestock and fishing	6	39,796	41,786
Mining and quarrying	8	1,100	1,749
Other foods	10	158,958	178,669
Clothing, textiles and footwear	11	67,944	78,815
Wood, cork and wood products	12	13,947	17,434
Paper products and packaging	13	17,706	22,310
Chemical Industries	14	20,297	23,342
Electricity & water	18/19	26,405	34,591
Trade wholesale and retail	21	143,326	196,357
Hotels and Restaurants	22	10,166	12,098
Passenger Transport	23	79,212	106,144
Goods Transport	24	42,138	54,779
Telecommunications	26	7,354	11,178
Banks and Insurance	27	18,135	23,213
Service Industries	28	109,764	140,498
Domestic Services		15,000	30,000[2]
Garages & Workshops	29	24,000	29,760
		846,042	1,068,247
			- 846,042
			222,205

1. We assume that price increases are equal to the direct and indirect increases in labour costs for all commodities except sugar (9), metal and electrical products (16) and other industries (17).

2. According to Table 31, Households spent an estimated Rs 15 million on wages of domestic servants. After a doubling of wages an additional Rs 15 million would have to be paid by households for this item.

In order to estimate the increase in household demand for various commodities following the doubling of wages, we shall assume that the share of each commodity, both locally produced or imported, in the households' budget remains constant after the increases in income and that the additional income is spent "pro rata" on each commodity.[1,2]

The original share of imports, including import duty, in household expenditure was 40 per cent. The estimated household expenditure on imports out of the increased income would thus be 950.5; import duty would amount to 95. The estimated household expenditure on domestic goods and services out of the increased income and at constant 1974 prices would be 1426. This represents an increase of 482, on the original household expenditure of 943.[3] Thus a doubling of wages would result in an increase of 51.1 per cent in the real demand for domestic goods and services.

If we assume as we have said above, that the extra income is spent "pro rata" on each commodity we can calculate the real product effects of the increase in wages.[4] We can determine the additional net output required of all the domestic industries to

meet/...

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1. We assume in other words, constant average household propensities to consume for all commodities. A more sophisticated approach would have considered the income elasticity of demand for each commodity. Unfortunately we do not have this information for Mauritius. An estimate of the income elasticity of demand for food items was made in 1968, based on the 1965 Household Expenditure survey. This information would now be of little use to us.
2. In their work on Botswana, Hayden "et al" consider two other possibilities. See C.Hayden "et al". Op.cit. p.16.
3. Excluding the wages of domestic servants.
4. We ignore the possibility of supply constraints, which may delay or preclude an increase in output in some sectors. In other words our analysis is based on the assumption that all industries keep in step with each other. The effect of a supply bottleneck in one or more sectors on the increase in output in other sectors can be easily brought into the model.

meet the estimated increase in household expenditure by the open Static Input/Output model:

$$\Delta q = (1 - A)^{-1} \Delta f \quad \ldots\ldots\ldots\ldots \quad (1),$$

where Δf is the vector of household expenditure by industry and Δq is the vector of industry outputs, both expressed in real terms.[1] An increase in the real output of each domestic industry increases factor income, the intermediate demand for imports and domestic goods, as well as Government revenue from import or excise duty. But as interindustry linkages are small in Mauritius, the multiplier effects on the output of domestic industries stemming from increases in household expenditure are likely to be small.

Alternatively we can once again have recourse to iteration in order to calculate approximately the total output requirements of domestic industries, by means of the following equation:

$$q_i = \alpha_i f + \sum_{j=1}^{n} \beta ij qj \quad \ldots\ldots \quad (2) \quad (i,j, = 1, \ldots, n; \; i \neq j)$$

where q_i = the percentage increase in expenditure on i in real terms.

αi = the household expenditure on i as a percentage of the total expenditure on i in the base year.

f = the percentage increase in real household expenditure

βij = the intermediate expenditure on i by the jth industry as a percentage of the total expenditure on i.

q_j = the percentage increase in real expenditure on j.

The increase in the output of domestic activities, which results from the increase in the real demand of households will in turn generate further factor income. If we assume fixed input-output

coefficients,/...

1. C Hayden "et al", op.cit. p.17.

coefficients, the intermediate input requirements, value added and share of each factor in the additional output of each domestic industry can easily be calculated. We shall assume that the additional income generated by the increase in domestic production will accrue to various factors - labour, private and corporate capital - in proportion to their original contribution in the value added. We shall also assume, as before, that household saving is a constant proportion of household income and tax revenue a constant proportion of households and firms income.

The second stage effect can thus be calculated by iteration by means of equation (2). The additional factor income generated as a result of the increase in household expenditure on domestic goods at the first stage amounts to Rs 265 million, or 22 per cent of the first stage increase in household income following the doubling of wages. This represents the second stage direct effect of increased household income. There will be also an indirect effect which arises as a result of the increase in the demand for domestic intermediate goods and services supplied by various industries. These interindustry transactions are however quite small. Therefore to the second stage increases in expenditure and income which flow directly from the initial increase in household expenditure on domestic goods, we must add the indirect effects arising out of the increase in the domestic intermediate consumption of each industry. The estimated increase in domestic intermediate consumption required to meet an increase of 493.9[1] in the demand for domestic goods

amounts/...

1. To determine the "second stage" increase in income etc, we have multiplied each item of original household domestic expenditure in Table 31 by 51.1%. This gave an increase of 493.9 compared with 482.4, the estimated first stage increase in household domestic expenditure.

amounts to 82.9[1]. This indirect demand for domestic commodities will give rise to further increases in factor income etc, which must be added to the direct effects to obtain the total income effects.

The increase of 82.9 in the demand for domestic input requirements in turn will generate additional factor income. We assume once again strict proportionality - i.e. fixed coefficients - between inputs and outputs. Thus the increase in the output of each domestic industry which is required to meet the increase in intermediate consumption at each stage, and the resulting increase in factor income, intermediate imports and Government revenue, can be calculated. The procedure followed to estimate the total income effects at each stage and the results obtained are given in schematic form below (Table 36). Assuming as we have done so far, a strict proportionality between inputs and output, in the distribution of factor income and household expenditure, the subsequent stages in the process of iteration can easily be "filled in" by estimation.

Effects of Wage Increases on the Balance of Payments and Government Net Revenue

Following the above procedure, we can estimate the macro-economic effects of the postulated wage increase (a doubling of wages) on the Balance of Payments and Government net revenue.

We first consider the consequences of a wage increase on the demand for imports.[2] The demand for imports will increase both

as a result/...

1. See Table 36.
2. We assume that the increase in wages has no effect on the price of export commodities and the value of exports.

TABLE 36 : ESTIMATED TOTAL EFFECTS ON HOUSEHOLD INCOME AND OUTPUT
(Rs million)

A1. First Stage Direct Effects

Increase in expenditure on domestic goods: 493.9

Made up of domestic
- Intermediate consumption (82.9)
- Imports of intermediate goods :(127.9)
- Govt. Revenue :(17.3)
- Factor income :(265.0)

B1. First Stage: Indirect Effects

Increase in expenditure on domestic goods: 73.1

Made up of domestic
- Intermediate consumption (17.7)
- Imports of intermediate goods :(16.2)
- Govt. Revenue :(3.0)
- Factor income :(36.1)

A2. Second Stage: Direct Effects

	(i)	(ii)	(i) + (ii)
Increase in expenditure on domestic goods (from A1)	106.5	+ (from B1) : 13.4	= 119.9
Made up of domestic			
- Intermediate consumption	:(17.2 +	2.2)	= (19.4)
- Imports of intermediate goods	:(28.1 +	3.5)	= (31.6)
- Govt. Revenue	:(3.7 +	.5)	= (4.2)
- Factor income	:(57.4 +	7.2)	= (64.6)

B2. Second Stage: Indirect Effects

Increase in expenditure on domestic goods: 17.1

Made up of domestic
- Intermediate consumption :(4.1)
- Imports of intermediate goods :(3.8)
- Govt. Revenue :(.7)
- Factor income :(8.5)

A3. Third Stage: Direct Effects

	(i)	(ii)	(i) + (ii)
Increase in expenditure on domestic goods (from A2)	26.23	+ (from B2) : 3.14	= 29.37
Made up of domestic			
- Intermediate consumption	:(4.27 +	.51)	= (4.78)
- Imports of intermediate goods	:(6.86 +	.82)	= (7.68)
- Govt. Revenue	:(.9 +	.11)	= (1.01)
- Factor income	:(14.18 +	1.70)	= (15.88)

etc.

B.3. Third Stage: Indirect Effects

Increase in expenditure on domestic goods: 4.21

Made up of domestic
- Intermediate consumption :(1.01)
- Imports of intermediate goods :(.93)
- Govt. Revenue :(.18)
- Factor income: (2.10)

etc.

as a result of the increase in household demand (the direct income effect) and also as a result of the increase in intermediate demand, which will follow the increase in household demand for domestic goods. We have estimated both the household and intermediate demand for imports at the three different stages - A1 to A3 in the above schema (Table 36). The estimated increase for both categories of imports - consumption and intermediate goods - is summarised below. More detailed figures are given in the Appendix.

T A B L E 37 : Increase in Imports (Rs million - 1974 value)

Household Expenditure	:	368.7[1]
Intermediate Demand	:	188.1
Total increase in imports	:	556.8

The year 1974, an exceptional year for the sugar industry, left a surplus of 301 in the Balance of Payments. Thus even in the halcyon days of 1974, a doubling of wages would, according to our estimates, have resulted in a deficit of 256 in the Balance of Payments. This shows the narrow limits imposed on wage policy by the Balance of Payments.[2]

Finally we consider the effect of wage increases on the Government net revenue. We may recall in this connection a statement from a report by the International Labour Office on Minimum

Wage/....

1. The estimated increase in imports following a doubling of wages is detailed in Appendix I, p.276. All figures are in Rs million.
2. If we assume strict proportionality throughout, the surplus of Rs 301 million would have been able to accommodate a uniform wage increase of about 54 per cent.

Wage Fixing and Economic Development:[1] "In developing countries, governments pay as much as 30 per cent and sometimes as much as 50 per cent of the entire national wage bill. The most immediate, obvious and painful effects of a higher minimum wage are felt in the public treasury." A doubling of all wages may affect Government in three different ways. Firstly the Government wage bill will double. Secondly the postulated rise in prices of domestic goods will increase Government expenditure. The increæes in Government expenditure will be partly offset however by a rise in tax revenue.[2] To consider first the increase in Government recurrent expenditure.

In 1974, the Government wage bill amounted to 252. A doubling of wages across the board, would increase Government wages to 504. Government spent 62.5 on various domestic commodities. Taking into account the price increases (assumed equal to the increase in direct and indirect labour costs) which would follow a doubling of wages and if we assume no change in Government real expenditure, Government would have to spend 82.4 to purchase the same quantity of commodities as before at the new prices. This we may call the price effect on Government expenditure.

On the other hand we have estimated the increase in revenue - from both the direct and indirect taxes - which would result from the doubling of wages and the increase in household income and expenditure. The changes in Government revenue and expenditure are summarised below. The changes in tax revenue are shown in more detail in the Appendix II.

TABLE 38/...

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1. International Labour Office: Minimum Wage Fixing and Economic Development. ILO Geneva 1968.
2. C Hayden, "et al": The Botswana Economy: Op.cit. p.23.

T A B L E 3 8 : Effects of Wage Policy on Government Net Revenue (Rs million - 1974 values)

Δ Wage bill		252.0
Δ Other Expenditure		19.9
Δ Tax Revenue :		
Direct taxes	- 9.8	
Indirect taxes	+ 65.8	
		56.0
Δ Net Revenue		-225.9

In Tables 29 and 30(i) of Chapter 4 (The Aggregated and Semi-Aggregated SAM), the excess of recurrent Government revenue over expenditure amounted to 87. But if we take into consideration accrued instead of actual revenue, the Government recurrent revenue increases from 631 to 887.6, and would result in a surplus of 343.6. Thus Government would have been able to accommodate the deficit of 225.9 in the recurrent budget which would have resulted from a doubling of wages in the public sector.

APPENDIX I

EFFECT OF A DOUBLING OF WAGES ON IMPORTS (Rs million)

	Import of Consumption Goods	Import of Intermediate Goods
1st Stage Direct Income effect:		
A1. Increase in household expenditure on imports of consumption goods	279.2[1]	
Induced expenditure on imports of intermediate goods		127.9
B1. Indirect income effect		
Import content of 1st stage increase in domestic intermediate consumption		16.2
2nd Stage Direct Income effect:		
A2. Direct household expenditure on imports of consumption goods	71.9	
Induced expenditure on imports of intermediate goods		31.6
B2. Indirect income effect		3.8
3rd Stage Direct Income effect:		
A3. Direct household expenditure on imports of consumption goods	17.6	
Induced expenditure on imports of intermediate goods		7.7
B3. Indirect income effect		0.9
	368.7	188.1
TOTAL EFFECT ON IMPORTS	556.8	

1. Estimated household expenditure on imports out of the new disposable income (net of D.T.I.) = 855.4
   - Original household expenditure on imports (net of D.T.I.) = 576.2

   D.T.I. = Duties and taxes on imports.

APPENDIX II

EFFECT OF A DOUBLING OF WAGES ON GOVERNMENT NET REVENUE

(Rs million) - 1974 values

First Stage Increase in Factor Income		
Direct Taxes		
Taxes on household income (after the doubling of wages)	+ 67	
Taxes on firms' income (after the doubling of wages)	-115	- 48.0
Indirect Taxes (households)		
D.T.I.		+ 30.3
Indirect Taxes (firms) (A1)		
D.T.I.	+ 13.44	
Other Indirect taxes (net of subsidies) ..	+ 3.83	+ 17.3
Indirect Taxes (firms) (B1)		
D.T.I.		+ 3.0
Other Indirect taxes (net of subsidies)		+ 2.6
Second Stage Increase in Factor Income		
Direct Taxes		
Taxes from 1st stage increase in household income	+ 12.4 (A1) + 1.6 (B1)	+ 14.0
Taxes from 1st stage increase in firms' income	+ 14.2 + 2.7	+ 16.9
		+ 30.9
Indirect Taxes (households)		
D.T.I.		+ 7.1
Indirect taxes (firms) (A2)		
D.T.I.	3.0 + .4 = 3.4	
Other Indirect Taxes (net of subsidies)	.7 + .1 = .8	
	3.7 + .5 = 4.2	
Indirect taxes (firms) (B2) ..	.7	+ 4.9
		+ 42.9

Third Stage/...

APPENDIX II (Cont'd)

Third Stage Increase in Factor Income:

Direct Taxes

Taxes from 2nd stage increase (A2) in household income : 2.7 + .34 =	3.0		
(B2) =	.4		3.4
Taxes from 2nd stage increase (A2) in firms' income: 2.9 + .36 =	3.3		
Taxes from 2nd stage increase (B2) in firms' income	.64		3.9

Indirect taxes (households)

D.T.I. (1.6 + .19 + .21)		2.0

Indirect taxes (firms) (A3)

D.T.I.	1.01	
Other Indirect Taxes (net of subsidies)		
Indirect taxes (firms)(B3)	.18	1.2
		10.5

Total Increase in Government Revenue:

First Stage	2.6	
Second Stage..	42.9	
Third Stage	10.5	56.0

NOTES ON THE COMPILATION OF THE SOCIAL ACCOUNTING MATRIX

These Notes describe the methodology used in the construction of the Social Accounting Matrix, the sources of data and their classification and the estimation procedure.

The Sources of Data

Most of the data was obtained from the Central Statistical Office. Trade statistics were obtained from the Annual Report of the Customs and Excise Department. The Central Statistical Office also helped with the classification of imports for the purpose of constructing the import matrix. Detailed information regarding the Government revenue and expenditure was obtained mainly from the Financial Report and the report of the Customs and Excise Department. We consulted the Ministry of Prices in the calculation of wholesale and retail trade margins. Finally details of the Balance of Payments transactions were supplied by the Bank of Mauritius. However in many cases we had recourse to estimation "to fill in" certain gaps in the data, especially in the case of intermediate transactions between production activities. In this case we used the information available for a subsequent year (1976) and "prorated" it back to 1974.[1]

The Classification of Production Activities (i) Agriculture

According to Pyatt and Roe,[2] a main guiding principle in any production classification is to define a separate category for any activity which is large or likely to become large, provided

also/...

1. See in this connection, G Pyatt and A R Roe: Op.cit. Statistical App.1 p.136.
2. G Pyatt and A R Roe: Ch 3, p.55.

also it has a distinct input structure. The method of classification must also relate to the objectives of the work. Our purpose is primarily to determine the place of sugar in the Mauritian economy; we must therefore separate the sugar industry from the rest of the economy. The transactions involving the sugar estates with factories are classified under three separate accounts: agriculture, manufacturing and transport; a separate account is allocated to cane planters, which covers both large and small planters; the distinction between cane production by millers and planters is explained by fundamental differences in the method of production.[1] The importance given to the factory estates in the classification is due also to the availability of data. As we have said above[2] detailed information is available regarding the value of inputs used by estates while very little indeed is known regarding the production and costs of medium or small scale enterprises. Seven accounts are allocated to agricultural production activities as follows: one account for cane production on millers estates, one for planters, one account each for food-crops, tobacco, tea, livestock and fishing and ancillary agricultural activities (essentially the value of work done by tractors and bulldozers). The account for food-crops (and other crops) includes the following activities: production of vegetables, fruit, aloe fibre and timber and that for livestock and fishing includes the production of beef, pork, mutton and goat, venison, poultry, milk and eggs and coastal and deep sea fishing.

The Manufacturing/...

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1. See above Chapter 1, page 31, Table 4.
2. See Chapter 4, p.227.

(ii)
The Manufacturing Sector

Manufacturing activities cover a wide range of industries. We have followed basically the same classification as the Central Statistical Office with some minor modifications. The manufacturing activities have been divided into nine different categories as follows: sugar (and by-products), other foods,[1] clothing, textiles, footwear, wood, cork and wood products, paper products and packaging, chemical industries[2], non metallic mineral products, metal and electrical products and other industries. Except for the sugar factories, the returns sent by most manufacturers gave no details regarding the value of intermediate inputs. These were "filled in" by estimation as explained above. The data concern essentially the large establishments. There is no up-to-date information regarding the small establishments. The last census of Industrial production was done in 1967. In certain cases the value of Gross and Net Output obtained from the Central Statistical Office had to be increased in order to accommodate the estimated value of imported supplies and other inputs used by the industry.

The total value of interindustry transactions amounts to Rs 2,186 million. If we exclude the value of the cane crop - (Rs 1,408 million) - these transactions amount to Rs 778 million. The value of imports of intermediate goods is Rs 928 million. These figures show the high import content of production activities in Mauritius.

The Services/...

1. This account comprises the following industries: meat and meat products, dairy products, msicellaneous foods, biscuits, bakery products, macaroni, distillery, compounding of wine, breweries, aerated minerals, cigarettes and tea.
2. Chemical industries comprise: pharmaceutical products, chemical fertilizers, plastic pipes, floor polish, wax, candles, carbonic acid, gas and organic and inorganic chemicals.

(iii) The Services Sector

This sector covers the following activities: Electricity, water, construction and public works, trade, hotels and restaurants, transport services, telecommunications, banks, insurance, legal and business services, miscellaneous services, garages and workshops and dwellings. Hotels and restaurants have been classified separately because of the importance of tourism, the third largest source of foreign exchange earnings and a rapidly expanding field of activity. These service industries, especially transport, construction, water and electricity belong to the non-tradeable or national sectors of the economy. These sectors, it is assumed, cannot trade because of transportation costs or other social and economic considerations; an increase in the demand for these activities due to an expansion elsewhere in the economy must be met by an expansion of output rather than by imports as is often the case in the tradeable sectors.

These non-tradeable sectors represent a major potential bottleneck in the development of directly productive activities in the developing countries. The critical factor is productive capacity. An increase in the output of electricity, road transport or telecommunication services requires large overhead investment. Infrastructural services may thus become an important bottleneck during a period of rapid economic expansion,[1] and in this respect, it is essential in the formulation of a coherent development strategy to determine the share of various activities in the demand for these services.

The Classification/...

1. See Government of Mauritius: 1975-80 Plan for Social and Economic Development, Ch 11-15.

The Classification of Households

Households occupy a special place in the Social Accounting Matrix. In the first place most of the factor income derived from production activities accrues directly or indirectly to households. The income of labour, housing and incorporated enterprises accrues directly to household; they also receive the largest share of interinstitutional income transfers. As the fundamental objective of Government social policy is the improvement of living standards, the pattern of income distribution within the economy is of central concern for policy. This necessitates "an exhaustive classification of households which identifies groups of special concern for policy and with respect to which the effects of policy are identifiable."[1] On the row side, households account for about one-third of the final expanditure and thus exercise a strong influence on the allocation of resources within the economy. In this way, every household acts as a fundamental link between the production system and the system of social accounts. Since the purpose of this chapter is to assess the importance of income redistribution within the economy and its effect on the macro-economic equilibrium, a detailed disaggregation of institutions and households is an essential part of the whole exercise. Unfortunately, as we have said before,[2] in the absence of a Household Expenditure Survey, it has not been possible to undertake a detailed classification of households, which considerably limited the scope of the whole exercise.

To obtain/...

1. G Pyatt and A R Roe: Social Accounting for Development Planning: Op.cit. Ch 3 p.56.
2. See above chapter 4, page 221.

To obtain details of household consumption expenditure, there are two possible lines of approach. The first one is based on household expenditure surveys where these have been carried out in the process of the preparation of a cost-of-living index. The procedure here is, in the first place, to calculate the expenditure on each item of consumption by scaling up the totals of expenditure obtained for the households covered in the sample.[1] The second stage consists in the identification of the source of supply of each commodity in the classification. The procedure here - which was followed in the Pyatt-Roe work on Sri Lanka - is to identify the import content of each commodity together with the import duty and other indirect taxes or subsidies which apply to these commodities. The residual part of the expenditure, after deducting the value of imports and indirect taxes is then disaggregated by production activity and by sector, which in the case of small specialised economies "is a straightforward matter given the one to one correspondence of commodities and production activities in many cases ..."[2] The major difficulty concerns the estimation of the contribution of trade and transport margins in the supply of each commodity.

The alternative line of approach may be called the production-plus-imports approach. In this case the vector of household expenditure is calculated in the following manner. Details of imports of consumer goods are available from the Trade Returns

of the/...

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1. We must however bear in mind that information based on sample surveys is subject to a certain margin of error and other biases but it provides a common and valuable source of data on household expenditure.

2. See G Pyatt and A R Roe: Stat. App.I p.121.

of the Customs and Excise Department.[1] Information about the import duty levied on individual import items is also available from the same source.

In Mauritius no census of distribution has yet been organised. That census would have provided valuable information about turnover, trade margins, changes in inventories and about the smaller trade establishments.[2] In the absence of a census of distribution, we obtain information regarding trade margins from the Ministry of Pricing and Consumer Protection, which controls the price of a wide range of commodities.[3] Work sheets were prepared from which the retail value of imported items of consumer expenditure was calculated.

The second part of household expenditure consists of locally produced commodities. The Central Statistical Office has information regarding the production of crops and other commodities. In the case of agricultural products, the information includes an estimate of the value of trade and distribution. In the other cases, the trade margin was calculated on the same lines as for imported items. The estimated amount of private consumption expenditure for 1974 in the national accounts is

Rs 1,684/....

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1. Imports of consumer goods are not the same as imports of goods for household consumption. A certain proportion of consumer good imports represents in fact intermediate consumption by hotels and restaurants and other establishments (hospitals); another part of the imports of consumer goods consists of ships stores and has been allocated to the Rest of World account.
2. The figure of private consumption expenditure which appears in the national accounts is a residual figure and is obtained by deducting the value of Government Consumption Expenditure and Gross Domestic Capital Formation from the estimated value of Gross Domestic Product at market prices.
3. These prices are fixed by the Ministry on the basis of returns submitted by traders giving their wholesale and retail margins. These may vary widely between different traders.

Rs 1,684 million. According to our own estimates the total household expenditure amounted to Rs 1,600 million, just five per cent less than the official figure.[1]

Trade and Distribution

An important sector in an extremely open economy like Mauritius.[2] The Island lives by imports and exports and consequently almost everything is bought and sold in Mauritius. The estimated value of wholesale and retail trade accounted for 9.6% of the GNP in 1974. This figure represents the official estimate of wholesale and retail trade margins, and would appear to be very conservative. The trade sector comprises a few large import firms which handle the bulk of the import trade and tend to specialise in a particular type of products, i.e. textiles, grain and cereals, ironware etc. There are several wholesale dealers and a large number of retail outlets ranging from the large departmental stores to small pavement stalls retailing cigarettes and sweets by the unit. There is also the usual countless army of middlemen, hawkers and pedlars, which is commonly found in all developing countries.

Trade and distribution represents a sizable part of the intermediate consumption of all sectors. Without the detailed information which would have been provided by a Census of Distribution, the trade and distribution account was built from the supply side by estimating and applying trade margins to the

c.i.f./...

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1. There may well have been a certain degree of underestimation on our part with regard to specific items of household expenditure.

2. See Table 32, page 255 for a measure of the openness of the Mauritian economy.

c.i.f. value of imports or ex-factory price of local supplies. The value of other production activities in the Input-Output matrix have been shown net of trade and transport costs. Imported items have been entered at their c.i.f. value and locally produced items at the farm or factory-gate price. The value of trade services in the accounts of individual industries consists of the estimated total trade charges borne by these industries with regard to the intermediate supplies used by them. Transport services have been allocated between various production activities. The estimated value of transport services used by each activity was based on the 1976 data.

In order to show the share of imports and local production in the intermediate consumption of various activities, it is assumed that both imported and local supplies are purchased directly by the industry concerned rather than via the trade and distribution sector as is generally the case. Otherwise imports of both consumer goods and intermediate goods would appear as one total figure in the input-output matrix and an important piece of information - the degree of dependence of various activities on imports - would be lost. Although with regard to certain imported items it was difficult to determine precisely the user sector - this would have involved going through a mass of trade bills and a considerable amount of work - it was in most cases a fairly simple matter to allocate imports between the various production activities owing to the detailed classification available in the Annual Report of the Customs and Excise Department.

Transport/....

Transport

Transport services are allocated to three separate accounts: passenger transport, transport of goods and sugar transport. Transport of planters' canes to factories is included in the transport of goods.

The value of inputs used by the transport sector was apportioned between passenger transport, transport of goods and sugar transport as follows: The value of the output of garages and workshops for motor vehicles repairs was divided between households - in respect of private cars - and transport services in proportion to the number of registered vehicles in each category. An estimated 45 per cent of registered motorcars and virtually all motorcycles belong to households, the rest of the cars to firms. Next the cost of repairs was apportioned between passenger and goods transport in accordance with the number of vehicles belonging to each category: the number of taxis and buses in the case of passenger transport and the number of vans, lorries and company vehicles in the case of goods transport. The same procedure was followed for fuel and tyres and tubes. In the apportionment of the cost of repairs, fuel and tyres and tubes among the different categories of transport activities, a weighting factor was used to allow for the different sizes of vehicles: buses and lorries were given a weight of 2, cars, taxis and vans a weight of 1 and motorcycles a weight of $\frac{1}{2}$. On that basis 22.5 per cent of the cost of fuel and lubricants was charged to goods transport (including sugar transport), 9.7 per cent to passenger transport and 10.9 per cent to households. Likewise the cost of repairs was allocated to a passenger and goods transport and households in the following proportion: 9.7, 27.7 and 17.3 per cent respectively.

In the case/...

In the case of sugar transport the figure for garages and workshops covers the cost of spare parts only - including import duty and trade mark-up - as no information is available regarding the cost of labour and imputed profit in respect of motor vehicle repairs carried out on millers estates. Much of the maintenance and repairs of the transport fleet on sugar estates is done by the estates themselves. Otherwise detailed figures are available regarding all items of cost incurred by estates on the maintenance and operation of their transport fleet.

Infrastructural and other Services

Infrastructural services include electricity, water, post and telecommunications and marine services. Electricity and water supplies are provided by Government corporations (the Central Electricity Board and Central Water Authority) while Marine Services[1] and Post and Telecommunications are still organised as Government departments and form part of the Central Administrative Services. In the Input/Output table, Electricity, Water and Post and Telecommunications have been classified separately and Marine Services have been included in goods transport. The surplus achieved by Government from Post and Telecommunications and Marine Services have been treated as an indirect tax paid by the user sectors concerned (goods transport in the case of Marine Services, and wholesale and retail trade and Households in the case of Posts and Telecommunications.)

For electricity and water, we obtained information from the Central Electricity Board and Central Water Authority regarding the cost of materials and services used and value added, which

appears/...

1. An autonomous organisation, the Mauritius Marine Authority, has since been established to manage the Port and Harbour services.

appears in columns 18 and 19. But there were no data regarding the sales of electricity and water to individual industries. In many Government departments the cost of water and electricity is charged to a single vote. Likewise in the Input/Output matrix the sales of electricity and water to various production sectors and institutions are shown as a combined figure.[1]

Service Industries comprise a wide range of services including private education, personal care and various forms of entertainment amounting altogether to an estimated gross output of over Rs 171 million.[2] Banking, insurance, legal and business services are classified separately as well as Hotels and Restaurants. Government expenditure on education, health and other services is included in Government consumption expenditure.

The bulk of the clientèle of hotels and restaurants come from tourists who spent an estimated amount of Rs 70 million in these establishments in 1974; a large part of Port expenditure was also charged to this account (in respect of ship stores and expenditure by crews of ships and airlines and service personnel). Hotels and Restaurants and banking, insurance, legal and business services are classified separately. We have followed, in this respect, the advice given by Pyatt and Roe with regard to the classification of activities. Both Hotels and Restaurants and Banking, etc qualify under these criteria to be treated separately from other service activities. Tourism has seen a rapid rate

of growth/...

1. On the basis of the 1976 data, which were prorated back to 1974.
2. This figure has been grossed up to accommodate an estimated Rs 50,7 million of exports of non-factor services.

of growth and, with earnings of Rs 111 million in 1974, is the third largest source of foreign exchange after the sugar industry and the export processing industries. Banking has also expanded rapidly in step with the development of economic activities in the Island. This account comprises the Bank of Mauritius, the Mauritius Development Bank and commercial banks, insurance companies, other financial and business institutions and the legal profession. The development of business activity and the establishment of new export industries have increased substantially the working capital needs of the economy. Besides a rapid rate of inflation has swollen the value of transactions. There has been a very rapid increase both in bank deposits and in the number of banks operating in the Island. The number of banking establishments doubled between June 1970 and June 1975[1] while the total amount of deposits, including demand, savings and time deposits, increased from Rs 295 million in December 1970 to Rs 1,234 million in December 1974.

Government

Government is the second largest employer in Mauritius and employed 45.5 thousand persons in 1974. There are besides a growing number of parastatal institutions, where wages and other conditions of employment follow closely those in Government. Owing to the small size of the Island Government services in Mauritius are highly centralised. Central Government is

directly/....

1.

	June 1970	June 1975
Number of banking establishments:	5	10
Number of branches :	32	53
Number of mobile units and counters :	37	35

Source: Annual Reports of the Bank of Mauritius.

directly responsible for many regional services which in other countries would devolve on local authorities. The current budget of local government institutions represents only four per cent of the Central Government budget. Moreover Government undertakes a number of commercial activities. Through its Supplies Control department, Government imported Rs 309 millions of rice and flour in 1974.[1] This is in line with the system prevailing in other developing countries.

As is generally the case much detailed information is available from official publications regarding the nature of Government expenditure and the sources of its revenue. However, as pointed out by Pyatt and Roe,[2] the conventional classification of revenue and expenditure is not appropriate for national accounting purposes and many adjustments must be made to the official set of accounts. In the first instance the recurrent budget may contain items which, from the economic point of view, are of a capital nature and, more significantly, the capital budget may include items of expenditure which should properly form part of recurrent expenditure.[3] For the purpose of the SAM, Government recurrent expenditure in turn must be divided between payment for goods and services and transfer payments. Another problem concerns the treatment of the Government non-contributory pension

scheme./....

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1. Imports of rice: 223.6
   flour: 85.4
   309.0

3. It is sometimes difficult to distinguish between recurrent and capital expenditure, especially in the case of labour intensive relief work projects. Relief workers may be paid from the capital vote and may be employed on a number of non-capital tasks as office attendants, couriers or odd-job men or in weeding and maintenance of public roads and drains etc.

2. G Pyatt and A R Roe: Op.cit. Statistical Appendix 1, p.121.

scheme. In our treatment of this item in the SAM we followed the procedure recommended by Pyatt and Roe. The figure of Rs 252 million representing personal emoluments of Government employees includes the imputed contribution to the (non-contributory) pension scheme. As in the case of Sri Lanka,[1] the imputed amount of contribution is made equal to the amount of pensions actually paid out.

The Central Statistical Office has information regarding the main items of Government expenditure for 1974, which show expenditure on goods and services separately from transfer payment. However, the information supplied by Central Statistical Office includes only the main heads of expenditure. To obtain details of Government consumption expenditure we had to refer to the Financial Reports, which give details of the expenditure incurred by each Ministry. These accounts however relate to the financial year (1 July to 30 June) and were converted to a calendar year basis by averaging the expenditure for 1973/74 and 1974/75. Details of Government imports - of consumption, intermediate and capital goods - were obtained from the Central Statistical Office. In that way we were able to prepare a detailed breakdown of Government consumption expenditure for incorporation into the SAM.

Another item in the Government Account relates to Food Aid. In 1974, grants of food received by Government under the US Government Food Aid programme amounted to Rs 57.5 million. Food aid received by Government was distributed partly to Development Workers who then received part of their wages in kind (Rs 7.5m);

partly/...

1. G Pyatt and A R Roe: Op.cit. Statistical Appendix 1, pp.124, 125.

partly to School children (Rs 50 million). The amount received by Development Workers was included under wages and salaries while the Rs 50 million distributed to school children should be included in the transfers to households.[1]

Government Revenue

On the revenue side, an important problem concerns the income base used to calculate Government revenue. Income tax in Mauritius is assessed and paid on the previous year's income. There is therefore a one year lag between the accrual and payment of the tax. This would not be so important if there had been only a slight change in income between 1973 and 1974. But 1974 was an exceptional year which saw an 80 per cent increase in GNP over the previous year's figure in the wake of the sugar boom.[2] As a result income tax revenue more than doubled in the next financial year 1975/76 as shown below:

TABLE 39 : GNP and Government Revenue - 1972 - 1975

Year	GNP at current or cost	GOVERNMENT RECURRENT REVENUE					
		Financial Year	Income Tax	Other Direct Taxes	Import Duties	Export Duties	Excise Duties
1972	1281	1972/73	77.6	21.1	107.0	29.9	59.5
1973	1666	1973/74	122.5	30.8	141.6	48.1	74.9
1974	2951	1974/75	191.2	34.7	187.8	129.8	88.9
1975	3107	1975/76	389.2	41.5	260.5	126.1	94.4

SOURCE: Bank of Mauritius Annual Reports 1976 and 1978.

The actual/....

1. See below page 299
2. See Chapter 4, page 246, footnote 2.

The actual amount of income tax paid in 1974 was Rs 152 million. But the total amount of income tax which accrued on the income earned by individuals and companies in 1974, and which was paid in the following year, amounted to Rs 409 million.

Other items of Government revenue include (1) taxes on consumption, consisting of import and excise duties; (2) the export duty on sugar and the Sugar Tax; (3) Licences; (4) Sales of goods and services, . (5) the surplus of Government departments and (6) interests, profits and dividends.

(1) Taxes on consumption: Information regarding the amount of import duty collected on various imported items was obtained from a document prepared by the Central Statistical Office showing the classification of imports by Broad Economic Categories. This classification gives the total amount of duty paid on each item. For the purpose of the SAM we had to determine the amount of import duty paid by each industry or production activity and this required a second classification of imports by user sector. In 1974, Government introduced a special surcharge on imports, in an attempt to raise additional revenue to meet the increases in the cost of rice and flour. This rate of surcharge was 10 per cent of the existing duty, on imports of intermediate and capital goods and 20 per cent on imports of consumption goods. The additional duty amounted to Rs 32 million. The entries in row 45 of Table 31 do not include the surcharge. Details of the excise duty paid by each industry was obtained from the Customs and Excise Report.

(2) The export duty on sugar and the Sugar Tax: The export duty on sugar was treated as a tax on production and charged against the profits of the sugar estates and cane planters "pro rata" the share of export proceeds accruing to each of them.

This/...

This tax was divided between cane producers and sugar millers in the following proportion 78:22. The sugar tax, which is a specific tax levied on factory estates, was charged entirely against the profits of the sugar factories.

(3) Licences: Details of licences paid by various establishments were obtained from the Central Statistical Office.

(4) Sales of goods and services: Sales of goods and services covers a miscellaneous collection of revenue from various sources ranging from the sale of agricultural products to police and court fines. The amount of Rs 14 million, was allocated to various accounts in the matrix. In certain cases (proceeds of sale of Government produce or service) it was treated as an indirect tax paid by the production sectors concerned; in other cases (payment of fines and legal charges) as a transfer from households to Government.

(5) Surplus of Government departments: Rs 12.2 million. This has already been dealt with above.[1]

(6) Interests, Profits and Dividends: This item consists of interests paid or profits transferred to Government by parastatal organisations (Central Electricity Board, Central Water Authority, Mauritius Housing Corporation, Mauritius Broadcasting Corporation, the Development Bank of Mauritius and the Bank of Mauritius); interests received on loans to educational establishments, Government officers and households (in connection with the House Service Sewerage Scheme). They amounted to Rs 17,5 million (average of actual revenue received in the 1973/74 and 1974/75 Financial Years) and were allocated as follows: Interests and/or dividends received from parastatal organisations or public corporations were treated as a transfer from these

1. See page 289.

institutions/...

institutions to Government, interest on loans to private educational establishments were charged to the Services account (Private Education). Interests on the House Service Sewerage Scheme and on loans to Government officers were treated as a transfer from Households and interests received from Local Government authorities as a transfer from Local Government.

TABLE 40 : Custom Duties and Other Indirect Taxes and Subsidies

(Rs million)

1. Custom duties (without surcharge)(Total of row 45)			153.2*[1]
(including surcharge)			185.3
2. The Calculation of indirect taxes/subsidies (Row 53 of Table 31)			
Excise duties subsidies and other taxes on Production			171.8
made up as follows: Sugar Tax (export duty and milling tax)		148	
Taxes on financial transactions		27	
Excise duties		73	
Other taxes: Licence taxes on transport, gambling and tourism		28.3	
Rent of HMS Mauritius and charges for other services		45	
Surplus of Government departments*[2]		12.2	
Rates paid on dwellings		2	
		335.5	
Less Losses of Central Water Authority	20		
Producer Subsidies (Seed potatoes, Loss on livestock feed factory, contribution to Colonial Steamship Co)	1.2		
Food subsidies	142	163.2	172.3

SOURCE: Government Financial Reports and Central Statistical Office

*1 This amount excludes 6.9 which is a balancing figure. (Refer to Table 31 row 45, col.31).

2 For the treatment of the Surplus/losses of Government Departments and rent paid on Government property (including HMS Mauritius) See above page 289.

Government Expenditure

The first important distinction to be made is between expenditure on goods and services on the one hand and transfer payments on the other. According to Pyatt and Roe,[1] "the distinction is well established in economic analysis and its importance from the point of view of studying the impact on the economy of Government expenditure is clear in that the first category of expenditure generates direct demands on resources and the second is primarily redistribution." Payment of wages and salaries amounted to Rs 252 million.[2] From the official figures, other consumption expenditure on goods and services amounted to Rs 191.9 million.[3]

Details of Government transfer payments and their destination are given below:

T A B L E 4 1 : Government Transfer Payments

Nature of Transfers	House-holds	Firms	Local Govern-ment	R.O.W.
Grants to religious Institutions	1.4			
Grants to education	10.5			
Old age pensions	23.4			
Public Assistance	21.2			
Interest payments on public debt: External				8.8
Internal	29.3			
Contribution to Mauritius Broadcasting Corporation		3.1		
Transfers to Rodrigues and Local Government			35.2	
Transfers abroad				9.0
T O T A L	85.8[4]	3.1	35.2	17.8

SOURCE: Central Statistical Office.

1. G Pyatt and A R Roe. Op.cit. Statistical Appendix 1 p.146.
2. See footnote next page.

It is interesting to compare the amount of Rs 252 million spent by Government on wages and salaries with the wage bill for sugar estates with factories which amounted to Rs 271 million. For the whole sugar industry - including cane planters - the total wage bill came to Rs 379 million. It is important to recall in this connection that 1974 was a record year when the industry made very large profits part of which were distributed to employers and workers in the form of boni. Comparing the Government wage bill with that of the sugar industry underlines the importance of Government as the alternative employer in the Island, a fact that has played an important part in the formulation and implementation of labour policy in Mauritius.[5]

Saving and Investment

Sources of Saving

The main source of corporate savings is the sugar industry. A number of deductions or levies are made from the gross proceeds of the industry to finance various statutory boards and agencies. Besides, the sugar industry contributes to a number of special funds. Details of the main deductions and contributions are given below:

TABLE 42/...

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2. This includes a sum of Rs 6,5 million (average of 1973/74 and 1974/75) representing the amount of salaries and wages paid to the personnel of the Telecommunications Department, which also appears in account No.26 of the Input/Output matrix.
3. Government subsidies on rice and flour amounted to Rs 142 million and producer subsidies to Rs 1,2 million. These subsidies have been posted to the accounts concerned as a negative tax: account No.10, in the case of food subsidies and No.6, 23 and 24 in the case of the producer subsidies.
4. To this amount should be added Rs 50 million of Food Aid distributed to school children, see above pp.293/294.
5. See Chapter 3, pp. 197 - 208.

TABLE 42 : Sugar Industry: Expenditure on Central Organisation and Research and Other Contributions

Expenditure on Central Organisation and Research: with contributions to:		
1. Sugar Industry Research Institute	3,582	
2. Sugar Industry Researve Fund	5,346	
3. Central Arbitration and Control Board	3,608	
4. Incidental expenses	757	13,293
Contribution to Special Funds		
5. Sugar Industry Development Fund	10,120	
6. Sugar Industry Labour Welfare Fund	3,173	
7. Graduated Export Duty	126,853	
8. Sugar Insurance Premium (estimated)	88,414	
9. Special Levy - Sugar Industry Fund Board	71,710	
10. Special Levy - Bulk Terminal	66,126	366,396

SOURCE: [illegible]

Total deductions amounted to Rs 417 million. Certain agencies, namely the Sugar Industry Research Institute and the Central Arbitration and Control Board, are financed entirely by these levies. It is as if part of the profits of the sugar estates with factories and cane planters was transferred to these agencies and, in return, millers estates and planters used their services in cane cultivation and sugar manufacture in the same proportion. In the Input/Output matrix, the contributions made to the Sugar Industry Research Institute and Central Board were credited to Service Industries and debited to the sugar cane estates planters and factories in proportion to their share of the sugar produced: 53%, 25% and 22% respectively. In the case of the contributions made to the Sugar Industry Development Funds, all of which is redistributed to millers and planters, this is a pure transfer and does not therefore appear in the

Input/Output matrix. The contribution to the Sugar Industry Labour Welfare Fund is used to finance the construction of houses for the sugar industry and dock workers and village welfare centres which form part of capital formation. They therefore represent a form of saving. In the SAM savings are obtained as a residual figure, equal to the surplus of the income of institutions and households, firms and Government over their expenditure.[1]

A comment regarding the nature of the Sugar Insurance Premium (Item 8). This is not an ordinary insurance nor is its income subject to taxation as in the case of other insurances. It is an equalizing fund which operates on the principle that reserves are accumulated in good years to compensate for losses suffered by producers in years of cyclone and drought.

Investment

Investment consists of construction expenditure which amounted to Rs 440 million, (dwellings Rs 169 million, non-residential buildings Rs 156 million and other construction and works Rs 121 million), Machinery and Transport equipment: Rs 231.6 million,[2] (of which imported equipment accounted for 84 per cent) and increases in stocks of sugar (Rs 166 million), manufactured goods (Rs 11 million) and imports (Rs 68 million).

The national/....

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1. See above chapter 4, pages 247.
2. According to the Central Statistical Office's Bi-Annual Digest of Statistics, expenditure on machinery and transport equipment amounted to Rs 290 million. These figures include the cost of installation of equipment and trade margin, whereas the amount of Rs 232 million does not include the cost of installation. The trade margin may also have been underestimated. On the other hand there are certain differences between the Central Statistical Office's classification of capital equipment and our own.(a)
   (a) See below: Table 44, pp.305/306 footnote 1.

The National Accounts give no information regarding changes in inventories. This is due to the fact that without a Census of Distribution, the Central Statistical Office has no information on which to calculate the value of private consumption expenditure. We have seen above[1] the problems to which that gave rise in the computation of Household Expenditure for the purpose of the SAM. In the computation of the National Accounts, private consumption expenditure is obtained as a residual figure after deducting from the estimated expenditure on Gross National Product the value of Government consumption and private and Government investment expenditure.

We have used information from the Central Statistical Office and Customs and Excise Department (concerning Goods in Bonded Warehouses) to obtain an estimate of increases in stocks, which we have incorporated into the Input/Output matrix and revised accordingly the estimated value of imported supplies used by various production sectors. However, in several cases, the entries in column 40 of Table 31 (Changes in stocks) represent a balancing figure between the column and row totals (i.e. between the estimated value of gross output and its distribution), rather than an estimate of actual changes in stocks. These figures must therefore be interpreted with caution.

During 1974 the value of goods in private bonded warehouses increased as follows:

TABLE 43/...

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1. See above p.286.

T A B L E 4 3 : Increase in the Value of Stocks

	Stocks (Rs 000) 31.12.73	Stocks (Rs 000) 31.12.74	Increase (Rs 000)
Tobacco manufactured	105.2	127.3	22.1
Tobacco unmanufactured	676.4	1.663.2	986.8
Beverages (mainly spirits)	612.8	1.114.5	501.7
Foodstuffs	774.8	830.9	56.1
Motor Spirit	1.159.2	5.060.4	3.901.2
Other petroleum products	6.406.1	16.516.4	10.110.3
Textiles	3.432.7	7.191.6	3.758.9
Other goods	7.869.5	16.605.7	8.736.2
TOTAL	21.036.7	49.109.9	28.073.2

SOURCE: Annual Report of the Customs & Excise Dept. for 1974.

The major increase occurred in Fuel and Lubricants (Rs 15 million). To these should be added the estimated increase in Government Stocks of rice: Rs 8,1 million.

The Rest of World

Mauritius lives by imports, which account on average for 56.5 per cent of Gross National Expenditure.[1] The structure of imports - the relative importance of consumption goods, intermediate supplies and capital goods - reflects the structure of production, and the small size of the manufacturing sector relatively to the primary (agricultural) and tertiary sectors. If we exclude the Export Processing Zone which may be considered as an offshoot of foreign markets and providing exclusively for their needs, we can say that there has been little fundamental change in the structure of imports since independence, consumption goods still accounting for over one-third of total imports.

(If we/...

1. Average of 1964-1974: Imports c.i.f., as a percentage of Consumption and Gross Capital Formation (less indirect taxes), Source: Central Statistical Office.

(If we include intermediate/consumer goods like flour, oil and fats and fruit preparations, the percentage goes up to over forty per cent).

Imports of industrial supplies and consumption goods had to be disaggregated for incorporation into Table 31. The industrial classification of imports was based in the first instance on the Central Statistical Office classification of imports by Broad Economic Categories. The second stage of disaggregation consisted in the classification of intermediate imports. These amounted to Rs 771 million (excluding motor spirit). Generally the more information there is regarding the nature of the imported commodity, the easier it is to identify the relevant user sector. In many cases it was a fairly simple matter to allocate imports between the various production activities, on the basis of the detailed classification given in the Report of the Customs and Excise Department. But, as stated above,[1] for certain items it was difficult to determine precisely the user sector concerned and in these cases we had to have recourse to guess estimation.

In our classification of imports we made allowance for (i) Government imports and (ii) changes in stocks, (iii) Re-exports. Detailed information regarding imports of consumption and intermediate goods by Government was obtained from the Customs Department and the Central Statistical Office. Government imports of building materials for construction works amounted to Rs 15.6 million. However as Government construction is included in the Construction account alongside private construction, it is logical to show Government imports of construction material as part of the imports of the Construction industry.

The Balance/...

1. See above page 287

T A B L E 4 4 : Classification of Imports

C.S.O. CLASSIFICATION OF IMPORTS BY BROAD ECONOMIC CATEGORIES		CLASSIFICATION OF IMPORTS FOR S.A.M.		
	(Rs 000) c.i.f.		(Rs 000)	Total
A. Capital Goods: Total Imports	200,552	Capital Goods: Total Imports		212,260
Machinery & Other capital equipment (except Transport)	163,219	Machinery & Other equipment) GDCF	174,927[1]	
Transport equipment (industrial)	23,548	Transport equipment) Firms (industrial)) and	23,548	
Passenger motor cars	13,785	Passenger motor cars) Govt a/cs 38 & 39*	13,785	
B. Intermediate goods: Total Imports	984,992	Intermediate Goods: Total Imports		927,544
Food & Bev, primary, mainly for Industry	13,124	Food & Bev, (primary & processed): Other Foods, Hotels & Restaurants, a/cs 10 and 22*	194,957	
Food & Bev, processed, mainly for Industry	150,952	Other industrial supplies including tyres and tubes:	519,888	
Industrial supplies n.e.s. including tyres and tubes	606,235			
Fuel & Lubricants, primary	412	Fuel & Lubricants including motor spirit (primary & processed): Transport, Electricity s.e.w.f. & R.O.W. (ships & aircraft) a/cs 23-25, 18, 1, 9, 36*	156,453[2]	
Fuel & Lubricants, processed (other than motor spirit)	137,223			
Motor spirit	21,095			
Parts & accessories for machinery & other capital equipment (Except transport) excluding tyres & tubes	19,342			
Parts & accessories for transport equipment (excluding tyres and tubes)	36,609	Parts & accessories for machinery & transport equipment: Garage and Workshops a/c 29	56,246	

C/....

C.S.O. CLASSIFICATION OF IMPORTS BY BROAD ECONOMIC CATEGORIES		CLASSIFICATION OF IMPORTS FOR S.A.M.		
	(Rs 000) c.i.f.		(Rs 000)	Total
C. Consumer Goods: Total Imports	570,775	Consumer Goods: Total Imports		512,120
Food & Bev, primary, mainly for household consumption	54,195	Food & Bev, (Primary & Processed)	385,301[3]	
Food & Bev, processed mainly for household consumption	331,761	Other Consumer goods	112,086	
Transport equipment, non industrial	4,153	Transport equipment (non industrial))Final Consumption of	4,153	
Consumer goods, n.e.s.	169,605	Passenger motor cars)households	10,580	
Goods n.e.s.	481	)a/c No.34		
Changes in stocks	-	Changes in Stocks		68,804
	1,756,319			1,786,288

SOURCE : Annual Report Customs & Excise Department and Central Statistical Office.

* The accounts/numbers are those of Table 31.

1 The discrepancy between the figure for imports of machinery in the SAM and the CSO figure is explained by differences in classification; for example: Industrial sewing machines are classified by CSO as consumer goods; they are classified as capital equipment in the SAM.

2 Includes an estimated Rs 17.1 million of motor spirit consumed by Households.

3 Consumption of (imported) rice, classified under Other Foods is expressed net of subsidies in the Input/Output matrix: If rice imports are included at their full c.i.f. value, the value of Food and Beverages consumed by households increases to Rs 385.3 million.

The Balance of Payments

TABLE 45 : Balance of Payments - 1974

	Receipts	Payments	Balance	
			Receipts	Payments
Merchandise (including Non-monetary gold)	1798	1526	+272	
Freight and Insurance on merchandise	-	191		-191
Service*(a)	326	185	+141	-
Goods and Services*(b)	2124	1902	+222	
Factor Services	26	20	+6	-
Private Transfers	41	11	+30	-
Current Account	2191	1933	+258	-
Add Govt. Transfers[1]	62	9	+53	
Net Capital Inflow	7		+7	
TOTAL	2260	1942	318	
Net Errors and Omissions			47	
Monetary movements: increase (-) in Foreign Exchange reserves			(-)365	

*(a) Details of Import and Export of Services are given in Table 46.

*(b) In Table 31, imports of merchandise c.i.f. and services amount to Rs 1831 million (1,991,550 - 160,029 (DTI)) and exports of merchandise and services, to 2,118 million. The discrepancy between the value of imports in Table 31 and the official figures may be due to the omission or underestimation of certain imported items.

SOURCE : Annual Report, Bank of Mauritius.

Figures of foreign trade and external receipts and payments were obtained from the Annual Report of the Bank of Mauritius. This information is summarised in Table 45. It shows a trade surplus (on goods and services) of Rs 222 million. This surplus is increased by net receipts of factor income of Rs 6 million and net private transfers of Rs 30 million. As regards the transfers

on Official/...

1. Regarding the posting of Government Transfers to the Capital Account of the Balance of Payments, see next page.

on official account, the bulk of these (Rs 57.3, of the Rs 62 million received by Government) represents the value of Food Aid.[1] Imports of flour and oil under the Food Aid programme are recorded with other imports in the merchandise account of the Balance of Payments. Pyatt and Roe have argued that "it is conceptually more correct to show this item of official transfer under the capital account."[2] We have followed this procedure and included Government transfer receipts and payments in the capital account. The total current account surplus amounted to Rs 258 million. To these sums must be added net Government transfers of Rs 53 million and a net capital inflow of Rs 7 million. These surpluses led to an increase of Rs 365 million in the Foreign exchange reserves.[3]

Import and export of services amounted to Rs 197 million and Rs 326 million respectively. They comprise the following items: Freight and Insurance on merchandise; Other Transportation, which includes passenger fares, time charter and port expenditure for bunkering, ships stores and other shore expenditure; Travel: Hotels and restaurants and other expenditure by tourists; Other Government expenditure: expenditure on embassies and embassy personnel, lease of HMS Mauritius, a naval communication base; and private expenditure: Insurance premium, payment for studies abroad, upkeep of aviation crews and service personnel and other expenditure of this sort. Details of import and export of services are given in Table 46 classified by type of import and showing the user sector in each case.

TABLE 46/...

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1. See above pages 293/294.
2. G Pyatt and A R Roe: Op.cit. Stat. Appendix 1, p.157.
3. Errors and omissions account for the difference between the figure of 365 and the Balance of Payments surplus of 318.

T A B L E 4 6 : Imports of Services 1974

	Import Category	User Sector		Amount (Rs million)
Freight and insurance on merchandise	Miscellaneous Services[1]	Production sector		191.0
Other transportion:				
Passenger fares & Time Charter	Miscellaneous services	Households	50.1	
		Government	5.0	55.1
Port expenditure: Bunkering	Miscelleneous services	Transport		18.9
Other Expenditure				
Travel: Transport of passengers	Miscellaneous services	Households	46.0	
		Government	5.0	51.0
Other Government expenditure: Sundry payments[2]	Miscellaneous services	Government		13.7
Other private expenditure:		Households	35.1	
Sundry payments	Miscellaneous services	B.I.L.	8.2	
		Service Industries	3.7	47.0
TOTAL				376.7

Exports of Services : 1974

	Type of Export	Production Sector		Amount (Rs million)
Other transportation: Passenger Fares & Time Charter	Transport (Passengers)	Transport (Passengers)	11.2	
Port Expenditure	Bunkering, ships stores	Fuel and Lubricant	69.2	
	Other expenditure by crews	Hotels & Restaurants) Service industries)	62.2	
	Demurrage fees	Transport of goods)		
	Marine Engineering	Garage & Workshops	3.7	146.3
Travel	Tourist Expenditure	Hotels & Restaurants	70.0	
		Transport of Passengers	42.0	112.0

Other/...

Exports of Services: 1974 (Cont'd)

	Type of Export	Production Sector		Amount (Rs million)
Other Government	Military transactions	Service Industries	14.1	
		Electricity	3.2	
	Non-military transactions	Service Industries	5.9	
		Dwellings	5.0	28.2
Other private:	Insurance premiums	B.I.L.	3.0	
	Aviation crews and service personnel	Hotels & Restaurants	6.2	
	Other expenditure	Service Industries	30.7	39.9
TOTAL				326.4

1 In the Input/Output matrix, Table 31, imports of commodities are valued at c.i.f. prices and include the amount paid for freight and insurance.

2 Sundry payments: include membership of overseas organisations, cost of embassy personnel, studies abroad (including scholarships), insurance premiums etc.

SOURCE : Bank of Mauritius.

CHAPTER 5

GOVERNMENT MINIMUM WAGE LEGISLATION IN THE SUGAR INDUSTRY

PART I

An Analysis of the Effect of the Wage Regulation Orders on the Sugar Estates Labour Force

In this chapter we shall study the effect of Government labour policy and notably the 1963 Wage Regulation Orders, on the level of wages and employment in the sugar industry. For this purpose we must determine in the first place the conditions which prevailed in the sugar industry labour market at the time in respect of the demand for and supply of labour, in order to appraise the effect of Government intervention in that market. More generally our analysis can provide an insight into the problem of wage regulation in plantation economies.

This chapter is divided into two parts: the first part begins with a brief description of the institutional framework behind the process of wage determination in the sugar industry, followed by an analysis of the conditions of employment of labour in the industry. The second part will consist of a quantitative analysis of labour productivity on estates, in order to measure the effect of seasonal conditions on productivity and the demand for labour.

The Institutional/...

I. The Institutional Framework

(i) 1946-62 - The Development of Collective Bargaining[1]

The first collective agreement in the sugar industry was signed in 1945 between the Chamber of Agriculture and the Engineering and Technical Workers Union, representing the artisans and other factory workers. The first collective agreement concerning field labourers was signed in 1947 between the Mauritius Sugar Producers Association (MSPA) and the Mauritius Amalgamated Labourers' Association (MALA). Both these associations had only recently been formed. Between 1946 and 1950, collective bargaining generally ended in deadlock and the dispute was settled by arbitration. There were two important strikes during that period: a strike of field labourers in October/November 1947, which lasted 19 days and involved 11,800 workers (25 per cent of the agricultural labour force) and a strike of artisans in 1950 and 1951. After 1951, labour relations became easier and voluntary agreements were reached between, on the one hand, the workers associations: the Mauritius Amalgamated Labourers' Association and the General Workers' Union (Engineering and Technical Branch) and on the other hand the Mauritius Sugar Producers' Association. These agreements were for a term of two and a half years. In 1954,

the General/...

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1. See:
   - T Balogh and C J M Bennet: Commission of Inquiry (Sugar Industry) 1962, Op.cit. Ch 2, pp.30/31.
   - J P Ducler des Rauches: Evolution of Industrial Relations in the Sugar Industry, in Revue Agricole et Sucrière, Vol.43 No.3, July-September 1964, pp.255/256.
   - P L Hein: Les Relations Industrielles à l'Ile Maurice: Op.cit. Ch 3, p.119.
   - Annual Reports, Labour Department

the General Workers' Union renewed its agreement with the MSPA. The agreement between the MALA and MSPA was not renewed but the MSPA continued to observe the conditions of the expired agreement. Between 1955 and 1957, annual agreements were reached between the employers and workers organisations, the MSPA, the MALA and the AGWU. A new agreement came into force in August 1958 between the AGWU and the MSPA in respect of the artisans but no agreement was signed in respect of labourers' wages, where the terms of the previous agreement continued to apply.

In 1959, negotiations between the MALA and MSPA broke down and the dispute was referred to arbitration. The tribunal awarded to the Union a 15 per cent increase in wages. Likewise the AGWU failed to reach agreement with the MSPA over the renewal of their agreement. This dispute was also referred to arbitration and inthat case also, a 15 per cent increase in wages was awarded. In both cases the arbitration tribunal recommended that the parties should negotiate a new consolidated agreement incorporating the terms of the awards. Accordingly an agreement was signed in August 1959, between the AGWU and the MSPA.

Other agreements were signed in July 1960 and June 1961. In 1962 the parties had again recourse to arbitration over the renewal of their agreements.

Ineffectiveness of Collective Bargaining

Commenting on the effectiveness of collective bargaining in the sugar industry, the 1962 Commission of Inquiry stated that nearly twenty years of collective bargaining did not appreciably raise real wages above the 1939 level; "The rise of 6 per cent over eighteen years is well within the

margin/...

margin of error in a period of violently changing food habits.[1] In the case of many artisan classes, real wages in 1957 were still well below the 1939 level."[2]

On the other hand, the Commission noted that the advance in real wages had been continuous since 1957. Real wages which were not materially above the 1939 level in 1957, had since risen by some 30 per cent. This marked increase in wages coincided with the advent of responsible government.[3] Between 1958 and 1961, the total wage bill increased by 29.5 per cent. As the price level remained virtually unchanged, it follows that the real value of these wages had also risen by 29.5 per cent in those three years.[4]

In practice the collective agreements concerned a limited number of workers. Thirty-eight per cent of the field labour force in 1968 were recruited and paid by job contractors and were not covered by these agreements.[5] On the other hand it has been argued that it might have been possible to provide an extension of the terms of a trade agreement to all employers in the industry.[6] It has also been pointed out that although collective agreements in Mauritius (as in UK) are not legally binding, it is

nevertheless/....

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1. This is presumably a reference to the fact that considerable changes had occurred in the pattern of household expenditure since the war, which much reduced the significance of the official cost-of-living index.
2. T Balogh and C J M Bennett: Commission of Inquiry (Sugar Industry) 1962: Op.cit. Ch 2, p.31.
3. See above, Chapter 2 pages 80/81.
4. T Balogh and C J M Bennett: Chapter 9, p.154.
5. D P Chesworth: Op.cit. p.7. According to Luce (1959) over one-third (38 per cent) of the field labour force was recruited and paid by job contractors in 1957. According to Meade (1961) two-thirds of the daily-paid workers, or 22,000 out of 34,000, were hired by job contractors.
6. P L Hein: Op.cit. Ch 3, pp.124/125.

nevertheless possible for an employee to sue an employer for the infringement of the agreement.[1]

(ii) 1963-1968 - The Wage Regulations Orders

In 1963, the Minister of Labour, acting under the powers conferred on him by the Wages and Conditions of Employment Ordinance No.71 of 1961,[2] established two wages councils, one for agricultural workers and the other for non-agricultural workers in the Sugar industry. Owing to the opposition of the employers, these Wages Councils were formed with independent persons. They began to operate on 8 May 1963, and the first Wage Regulation Orders were made on the 22nd July and 1st August 1963.

The Wage Regulation Orders provided for a general increase in wages of about 25 per cent for agricultural workers and about 30 per cent for non-agricultural workers.[3] The Sugar Wages Councils also recommended the abolition of the system of job contractors for the recruitment and payment of the estate labour force. In future payment of all workers employed by estates should be done directly by the employer.[4]

Another/...

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1. The problem of the representation and legal protection of workers by means of collective agreements was raised as early as 1948, when the Labour Commissioner rejected a proposal to repeal the Minimum Wage Order for sugar industry field labourers on the grounds that it was adequately replaced by an Agreement between the employers and the Union concerned. (Annual Report of the Labour Department: 1948).
2. Ordinance No.71 of 1961 empowered the Minister of Labour to set up Wages Councils if he was satisfied that no adequate machinery existed for the effective regulation of the remuneration and other conditions of employment of the workers in any trade, industry or occupation or that the existing machinery was likely to cease to exist or to be adequate for that purpose.
3. See above Chapter 3, page 134. Wages and conditions of employment of staff grades in the industry were also covered by the Wage Regulation Orders. These grades obtained an increase of approximately 10%.
4. This recommendation was implemented in 1965.

Another important recommendation of the Wages Councils concerned the introduction of a scheme of guaranteed intercrop employment. Under this scheme workers who had worked with the same employer for 80 per cent of the crop were entitled to be offered full employment during the intercrop and workers who had worked more than 70 per cent but less than 80 per cent of the crop were entitled to proportionate employment during the intercrop.[1] Under the new Wage Regulation Orders workers with an 80 per cent attendance record were entitled to paid estate holidays (previously taken on an unpaid basis by daily-paid workers) and five days annual leave at the New Year. Other provisions concerned hours of work.

Between 1964 and 1967, wages in the sugar industry remained at the 1963 level. This is explained partly by the deterioration in the financial situation of the industry, following the sharp drop in sugar prices on the world market.[2] Amendments were brought, however, to the Security of Employment Ordinance in 1965. These amendments modified the intercrop work entitlement with a view to sharing the available work among a greater number of workers. The Ordinance was further amended in 1966.

An important amendment was made in 1968[3] to the provisions of the law with regard to intercrop employment. Henceforth the labour force was divided into two groups (a) the regular labour force and (b) the supplementary labour force.

(a)/...

1. For technical reasons this recommendation was not included in the Wage Regulation Orders and was implemented by means of a separate Ordinance: The Security of Employment (Sugar Industry) Ordinance No 28 of 1963.
2. See Chapter 3, page 135, footnote 1.
3. Act No 18 of 1968.

(a) The regular labour force comprised monthly and daily paid labourers who had achieved a certain rate of attendance and performance during the crop. Daily paid workers must work at least for 55 per cent of the crop in order to remain in the regular labour force and safeguard their right to intercrop employment.

(b) The number of persons in the supplementary labour force was computed as follows: 15 per cent of the difference between the number of persons employed during the crop and the regular labour force, as defined above, or the average number of qualified persons during the preceding three crops (in that case the 1965, 1966 and 1967 crops), whichever is the highest. Workers forming part of the supplementary labour force should be those with the highest record of attendance at work during the crop, who would under the previous legislation have qualified for employment during the intercrop.

These were the main enactments of the Government legislation with regard to the sugar estate labour force. After 1963, however in an increasingly saturated labour market and in the face of rapid increase in unemployment, the right to work became the fundamental social and political issue and this was reflected in the Government labour policy. Besides, after the exceptional conditions of 1963, the price of sugar on the world market dropped sharply to its lowest postwar level in November 1966. This led to a serious deterioration in the financial situation of the industry, especially considering the rapid increase in the cost of cane cultivation on estates in the wake of the substantial wage increases between 1957 and 1963.[1] In these conditions

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1. See footnote next page.

the stabilisation of wages became a major pre-occupation of Government as it grappled with the problem of unemployment.

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II. The Sugar Industry Labour Market : The Demand for Labour

(i) Seasonal Differences in Productivity

Seasonal variations in climate and temperature have an important influence on agricultural production generally and on the productivity of factors - labour, capital - used in combination with land in agriculture.[2] Usually in studying the input-output relationship in agriculture, annual totals of inputs and output are used. That is because production occurs after a fairly long interval, the cropping cycle generally extending over several months. This period covers both a busy and slack season. Output coefficients derived by means of a smooth continuous function fitted to annual values of inputs and output would be seriously biased where seasonal variations in climate have an important bearing on output.[3] On the assumption that there are important seasonal differences in labour productivity, reflecting differences in climatic conditions, we

shall/...

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1. The 1962 Commission noted that the increase in the sugar industry wage bill by about 30% between 1958 and 1961 led to a sharp increase in the cost of cane cultivation while the cost of milling had remained relatively constant. T Balogh and C J M Bennet : Commission of Inquiry (Sugar Industry) 1962, Ch 9:47, p.154.
2. The definition of land in economics usually includes natural resources: Climate, topology etc. R G Lipsey: An Introduction to Positive Economics, 3rd edition. Ch 26, p.340.
3. S K Nath: Warwick Economic Papers. Department of Economics University of Warwick, Coventry, May 1973, mimeo.

shall divide labour into two categories - crop and intercrop - for the purpose of statistical analysis.

There is much evidence regarding the importance of seasonal conditions on the productivity of labour in cane production in Mauritius.[1] A number of reports have referred to the sharp drop in employment and earnings of labour between the crop and intercrop, reflecting changes in the conditions of demand for labour during each period. R W Luce,[2] who studied the wages and conditions of employment of labourers and artisans in the sugar industry in 1958, reported that there was a fall of 21 to 25 per cent in the average number of daily-paid male labourers employed on estates between the crop and intercrop. Besides /a large proportion of field work during the intercrop was designated as Class II work and the rates paid for that class of work were about 25 per cent less than for Class I work.[3]

The 1962 Commission of Inquiry considered, inter alia, the problem of wages and the employment situation in the sugar industry. In their report, the Commissioners stated that the monthly rate of earnings during the intercrop represented a decrease of 30 to 40 per cent against crop payments. "As the decrease in numbers is only 12 per cent, it is

obvious/....

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1. "Field operations in the intercrop season ... are closely dependent upon weather conditions. It is not only the cyclical variations of climate but also the occurrence of chronic disturbances - and the frequency of these may vary considerably from one region to another - that most often determine the pattern of cultivation work and the rate at which such work should be carried out."

   A statement by the Mauritius Chamber of Agriculture on Decasualisation and Reclassification ... (in Report of the President of the Mauritius Chamber of Agriculture for 1958/59) Op.cit. App. A, p.(ix)

2. R W Luce: Report to the Government of Mauritius etc. Ch 6, Part II, p.19.
3. Idem: Ch 6 Part II p.19.

obvious that the claim of workers, that during the period between crops they are not receiving the same level of wages is borne out."[1]

The data in Table 47 below relates to the average earnings of a sample of field labourers during the crop and **intercrop** in 1958 and is taken from the Luce Report. It shows that there was a decline in average earnings not only between the crop and intercrop season but also within each season.

T A B L E 4 7 : Average Daily Earnings of male Labourers on Estates in 1957/58 (Computed from original data Based on Field Inspections carried out by the Labour Department)

Crop period 1957	Grande Bande*			Petite Bande*		
	No of labourers	Daily Earnings (Rupees)	Daily Wage Bill (000 Rupees)	No of labourers	Daily Earnings (Rupees)	Daily Wage Bill (000 Rupees)
July	645	5.67	3,657	610	3.27	1,995
August	1,649	5.99	9,878	283	3.44	974
September	1,418	6.70	9,501	259	3.48	901
October	1,657	6.97	11,425	175	3.49	611
November	1,167	6.55	7,644	543	3.64	1,977
December	355	5.16	1,832	868	4.07	3,533
Intercrop period 1958						
January	44	4.70	207	855	3.67	3,138
February	148	3.90	577	1,116	3.92	4,375
March	75	4.03	302	1,252	3,59	4,505
April	140	4.53	634	1,077	3.37	3,629
May	353	3.76	1,327	1,061	3.26	3,459
June	85	3.44	292	782	3.37	2,635

* The term 'Grande Bande' denotes the labourers employed on heavier work: i.e. destoning and land clearing, special weeding, cutting and loading. The term 'Petite Bande' denotes labourers employed on lighter work.

1. T Balogh & C J M Bennet: The Commission of Inquiry (Sugar Industry) 1962: Op.cit. Ch 9, p.155.

This fall in earnings may be explained by changes in the nature of the work, which is reflected in the percentage of different grades of labour employed each month on estates. Most of the work done on estates during the intercrop was considered to be of Class II or lower standard and paid at a lower rate. Most of the male labourers during the crop were employed at cutting and loading which is Class I work. The data in Table 48, which is taken from the Annual Reports of the Labour Department, shows the mobility of sugar estate labourers among the different grades and the changes in the nature of the work and pattern of employment on estates, month by month, for 1955 and 1960. These statistics show also that the structure of employment on millers estates was much more stable during the intercrop, than during the crop period. The reason for this is that during the months of July to December, several field operations carried out on estates - land clearing, fertilisation and weeding - relate to the following crop. The overlapping of crop and intercrop operations in the second half of the year accounts for the fluctuations in the percentage of the different categories of labour employed on estates during these months.

The mobility of labour between grades shows that the differences in labour classification reside in the nature of the work not in the quality of labour. To quote from Luce:[1] "The practice is for the employer to designate a large proportion of field work during the intercrop as work requiring less than the physical strength and/or skill required for Class I work, and accordingly to offer the wage rate appropriate to Class II ... I can see no sort of justification

for the/...

1. R W Luce: Report to the Government of Mauritius etc: Op.cit. Ch 6, Pt II, p.23.

TABLE 48 : Mobility of Sugar Estate Labourers Between the Grades Percentage of Different Grades Employed on Estates Each Month

	1955				1960*			
	GB	PB	Women	Juveniles	GB	PB	Women	Juveniles
January	14	42	43	1	6	52	40	2
February	12	42	45	1	2	50	47	1
March	9	47	39	5	4	56	39	1
April	6	48	44	2	8	44	46	2
May	9	49	40	2	17	42	38	3
June	10	48	40	2	10	50	37	3
AVERAGE INTERCROP	10	46	42	2	8	49	41	2
July	24	31	44	1	35	30	33	2
August	62	7	28	3	50	15	34	1
September	54	6	39	1	59	5	35	1
October	55	6	38	1	55	10	33	2
November	58	8	33	1	45	18	35	2
December	19	34	46	1	25	35	39	1
AVERAGE CROP	45	15	38	1	45	19	35	1

* Cyclone "Carol" destroyed 50% of the cane crop in 1960. These abnormal conditions may account for certain differences in the pattern of field work in 1960 as compared with 1955.

GB : Grande Bande (Grade I labour)
PB : Petite Bande (Grade II, III labour)

SOURCE: Annual Reports of the Labour Department for 1955 and 1960.

for the practice which, so far as I am aware is peculiar to Mauritius ... (The labourer) is prepared, "semble", to make the same physical effort during the intercrop as he did during the harvest and it is no fault of his that the character of the work has changed with the passing of season."

The wage rate paid at the time for Class I work was reported to be 25 per cent above Class II rates which stood at 15 per cent above the Class III rates. These differences in rates reflect differences in the arduousness of the task, hence the productivity of labour employed on each operation.[1]

According to the cost minimising principle, variable factors should be used in production so that the ratio of their marginal productivity is equal to the ratio of their prices. Applied to labour this would mean that the ratio of the marginal productivity of different categories of labour should be equal in equilibrium to the ratio of their wages. In the context of the employment of field labour in the sugar industry, this would imply that, in a competitive labour market, the difference in the rates paid to different categories of labour would be equal in equilibrium to the difference in the marginal productivity of the work performed by them. On the assumption that there was, in the absence of Government intervention in the fifties and early sixties, a close relation between the wages paid to workers and their marginal productivity, if we consider the changes in the pattern of employment on estates, month by month, as

measured/....

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1. "(The classification of work on estates) is based on the principle that ... certain types of work require a certain amount of physical exertion and proficiency which is worthy of a higher wage than other types requiring less effort ... this principle corresponds closely to conditions of work existing in the sugar industry. Furthermore, it stands to reason that if all types of work were paid for at one and the same rate all workers would naturally ask to perform the easier task; there would be a glut of labour for lighter work and the more arduous but essential types of work would be left undone ..."

   A statement by the Mauritius Chamber of Agriculture on Decasualisation and Reclassification ... Op.cit. App. A, p.(x).

measured by the quantity of labour employed of each grade, we can obtain an indication of the importance of seasonal factors on the marginal physical product of labour, hence on the demand for labour on estates during that period.[1]

Besides climate and weather, other factors have an important influence on the productivity of labour. They are: the quality of management and technology which determine, in conjunction with natural factors, the marginal physical productivity of labour while the price of cane represents its value component. These factors exert their influence over the whole crop. However, as our analysis focusses on the Government minimum wage regulations, which concern primarily the intercrop labour force, we shall be much more concerned in this chapter with the seasonal differences in the productivity of labour.

Figure 3 below shows the percentage of Grade I and Grade II male labour employed on estates during the year. The corresponding data is shown in Table 49.

The figures in Table 49 are an average of the 1955, 1958 and 1960 figures.[2] We have seen above that the classification of labourers depended on differences in the nature of field operations and their productivity rather than the efficiency of the worker. If we assume that Grade I and Grade II

FIGURE/...

1. The demand for labour depends on its marginal revenue product and the wage rate, while the supply of labour depends on the wage rate and the marginal disutility of work. Under competitive equilibrium the demand for labour equals the supply of labour and the marginal disutility of work will be equal to the marginal revenue product of labour. Following from this it can be argued that in a free market differences in the rates paid for different operations will reflect differences in the marginal revenue product of labour and in the amount of effort or skill involved in these operations.

2. 1960 was a cyclone year and the employment figures for that year may not be strictly comparable with those of the other two years.

FIGURE 3 :

Percentage of Grade 1(G.B) and Grade2(P.B) Labour on estates(Average: 1955-58-60.)

TABLE 49 : Average 1955 - 1958 - 1960

	G.B.	P.B.	Women & Juvenile	Total
January	10.7	44.7	44.7	100
February	6.7	46.7	46.7	100
March	5.7	54.0	40.3	100
April	6.7	45.3	48.0	100
May	13.7	45	41.3	100
June	9.3	50	40.7	100
AVERAGE INTERCROP	8.3	48	43.7	100
July	28.3	31.3	40.3	100
August	55	11.3	33.7	100
September	57	5.0	38.0	100
October	55	7.7	37.3	100
November	50.3	14.3	35.3	100
December	24	33.7	42.3	100
AVERAGE CROP	45	17	38	100
AVERAGE WHOLE YEAR	26.7	32.5	40.9	100

SOURCE: Annual Reports of Labour Department

labourers are employed for the same number of days each month, that the rate of attendance is the same and that the productivity of labour is uniform within each grade, one Grade I labourer being as productive as any other labourer of the same grade in a given period, and likewise for Grade II labour, the percentage of Grade I and Grade II labour employed will give an indication of the relative quantity of Grade I and Grade II work performed on estates in each period. This in turn reflects the importance of seasonal influence on the marginal productivity of labour and hence on the demand for labour between the crop and intercrop and within each season.

The difference/...

The percentage of different categories of labour employed on sugar estates during each season is shown in Table 50. These figures cover the period 1950 to 1960 and are six-month averages in each case.

T A B L E 5 0 : Percentage of Labourers of Each Category

YEAR	INTERCROP				CROP			
	GB	PB	Women	Juve-niles	GB	PB	Women	Juve-niles
1950	20	35	39	6	53	10	35	2
1951	24	30	40	6	57	8	37	4
1952	18	32	45	5	46	9	40	5
1953	20	34	41	5	50	9	37	4
1954	16	37	45	2	54	9	35	2
1955	10	46	42	2	45	15	38	2
1956	5	50	43	2	42	16	40	2
1957	6	49	43	2	44	20	34	2
1958	7	49	42	2	45	17	36	2
1959	11	44	43	2	48	13	37	2
1960	8	49	51	2	45	19	35	1
AVERAGE 1950/60	13	41	42	3	48	13	37	2

SOURCE: Annual Reports of the Labour Department

These figures reveal the same seasonal variations in productivity as shown in Table 49 and Figure 3. They show also the changes which have taken place over time in the structure of employment with the rapid decline in the percentage of Class I or Grande Bande labour during the intercrop as a result of the mechanisation of the heavier field work.[1]

(ii)/...

1. See below page 399.

(ii) The Demand for the Crop Time Labour Force

While weather conditions may have an important influence on the tonnage of cane produced and labour productivity during the intercrop, they also influence the employment of labour during the crop. The price of cane depends on the quality of cane produced and the price of sugar. Cane quality in turn depends on climatic conditions - rainfall and temperature during maturation - and the time of harvest.[1] It is measured by means of the sucrose content which generally improves during the first few weeks of the crop and drops sharply after the end of November. The optimum length of the crop, taking into consideration the crushing capacity of factories and cane quality is generally five months, from the beginning of July until the end of November.[2] Most factories start crushing in the last week of June and the crop finishes about the middle of December, although in certain years one or two factories finished crushing after the New Year.[3] It is clearly in the interest of producers, both millers and planters, that the cane should be processed when it is at its maximum richness in terms of sucrose. They will therefore try to cut and process the cane as close as possible to its maturity. "Ceteris paribus", the shorter the crop duration, the higher will be the amount of sucrose in the cane and the higher the amount of sugar extracted from cane. This accounts for the brisk

demand/...

1. See Chapter 5, page 357 below

2. K Lutchmenaraidoo 'et al': Commission of Inquiry (Sugar Industry) 1972-73, Ch 6, p.47

3. The 1972 crop at Deep River-Beau Champ lasted until 11 January 1973.

demand that exists for labour during the crop. During that time factories operate at or near full capacity.

Climatic conditions may also affect labour productivity in a different way. According to data published by the Mauritius Sugar Producers Association there is a substantial drop in average productivity - in terms of the tonnage of cane cut and loaded per worker - between the first half of the crop season - July to September - and the second half - October to December. These figures are shown in Table 51 below:

TABLE 51 : Comparative Rates of Productivity (Tons of Estate Cane Cut and Loaded per Worker)

	1973	1974	1975	1976	1977	1978	1979[1]
Whole Island:							
July to September	2153	2177	1708	2051	2136	2373	2449
October to December	1853	1902	1587	1775	1991	2379	2490

Comparative Rates of Absenteeism at Cutting and Loading (Absent Labourers per cent of Registered Labourers)

	1973	1974	1975	1976	1977	1978	1979[2]
Whole Island:							
July to September	16.9	17.3	22.6	19.1	22.9	20.8	20.2
October to December	21.6	21.9	23.6	24.0	25.7	24.0	18.7

SOURCE: Mauritius Sugar Producers Association

1. The figures for 1979 cover nineteen estates, instead of twenty-two. They are not strictly comparable with the figures for previous years.
2. Note the steady improvement in productivity since 1976, reflecting the increasing mechanisation of cane loading operations.

Moreover this seasonal drop in productivity coincides with an increase in the rate of absenteeism.[1]

The reason for the drop in the productivity of cane cutters between the first part and second part of the crop season may be explained partly by the heavy physical nature of the work involved in cane cutting and loading - a hard, back-breaking strenuous operation[2] and inadequate nutrition[3,4]. An inadequate diet undermines the labourer's resistance to fatigue and is reflected in a drop in average productivity and increase in absenteeism as the crop proceeds. Besides,with the arrival of the hot season after mid-October, field work becomes very uncomfortable and this further reduces the rate of output of cane cutters.[5] For the same reason there is generally a lower rate of productivity among cane cutters on coastal estates as compared with those of the interior.[6]

As far as cane quality is concerned there is generally a fairly substantial improvement during the first half of the crop season - between July and October. For the whole island on average, the amount of sucrose in cane reaches its peak around the middle of October and then declines, dropping sharply after the end of

November./....

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1. However more recent data for the period 1976 to 1979 do not show the same seasonal fall in productivity, although the increase in absenteeism persisted during the second part of the crop.
2. D Ah-Chuen, A H Hossenmamode and A K Gujadhur: An Investigation of Factors Relating to Absenteeism among Cane-cutters on the Bel Ombre Sugar Estate, Chapter 3, p.28.
3. Chambre d'Agriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre dans l'Industrie Sucrière, Ch 2, pp 15, 16.
4. D Ah-Chuen et al, An Investigation of Factors Relating to Absenteeism etc. Op.cit. Ch 3, p.41.
5. Idem, Ch 2, p.22.
6. Chambre d'Agriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre: Op.cit. Ch 2, p.22.

November. This is the general pattern but there are of course variations from year to year due to changes in climatic conditions which may affect both the maturation date and the amount of sucrose in cane.

III. The Supply of Labour

Our analysis of the conditions of supply of field labour in the sugar industry will consist of an enumeration of various factors which may influence the rate at which agricultural labour is available for work on estates. The influence of wages on the supply of labour may be less determinate in countries like Mauritius than in more industrialised societies. Our purpose will be to identify the factors which may influence the labourer in his attitude towards field work and his willingness to supply his services for work on estates; this approach may be more important in an analysis of the labour supply conditions than a dogmatic adherence to 'a priori' concepts and assumptions, which may not be relevant or applicable to conditions in Mauritius.

(i) The Organisation of the Estate Labour Force

We begin with a description of the system of recruitment and payment of agricultural labour on estates in the nineteen fifties and sixties. The estate field labour force then comprised a small number of permanent (monthly paid) workers; they represented 7.4 per cent of the field labour force. The bulk of the labour force cosnisted of casual workers most of them recruited and paid by job contractors. In 1961, Meade referred to the increasing casualisation of the estate labour force. "In the period 1950 to 1958 the difference between the labour force employed

in the/....

in the intercrop and crop season increased from 8,248 to 11,634 (in 1959 it increased further to 13,880) and the total regular labour force (including labourers employed on monthly contracts) fell from 12,270 to 9,087, that is from 18 per cent to 16 per cent of the whole."[1] Two-thirds of the daily-paid labour force were recruited and, in the majority of cases, paid by job contractors. The reason for this change, according to Meade, was that, from the estates point of view, casual labour was cheaper than the monthly-paid regular labour. The worker recruited through the job contractor was not organised, had little bargaining power and his conditions of service were not covered by the collective agreements concerning the terms and conditions of employment in the industry. Besides he was not entitled to any of the fringe benefits of the monty monthly-paid worker. Meade added that the system of recruitment and payment of field labour on estates had an important influence on the conditions of supply of labour; especially the high rate of absenteeism.[2]

On the other hand the Chamber of Agriculture expressed the opinion that the casualisation of the estate labour force was the outcome of a deliberate choice on the part of labourers. According to the Chamber many casual labourers

chose/...

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1. J E Meade, 'et al': The Economic and Social Structure of Mauritius. Op.cit. Ch 4 §4:14 pp.62/63.

2. Luce and Meade believed that the decasualisation of field labour and the elimination of job contractors would encourage workers to work longer hours and would reduce the rate of absenteeism on estates. As it turned out the creation of a permanent labour force did not bring a significant decline in absenteeism among the estate labour force. See above page 329 Table 51, and the Appendix to this Chapter.

chose to work seasonally on estates. "They belong to the category of casual labour by inclination." This practice also made the supply of agricultural labour more flexible to meet the seasonal variations in the demand for it.[1]

(ii) Demographic Factors

The supply of labour depends on demographic factors, the size and age structure of the population, on sociological factors, which determine the attitude of workers to different types of employment, on the working conditions: geographical location, topography, weather and the nature of the work, hence its relative disutility, and on the importance of alternative job opportunities.

With 1,147 persons per square mile, Mauritius has one of the highest population densities in the world. Fifty per cent of the population is under twenty. On the other hand less than half (46.5 per cent) of the working age population of 560,000 is economically active. The participation rate is very low especially among women; in 1972 only twenty per cent of the female population aged 15 years and over was economically active.

(iii) The Dislike of Field Work

Although the sugar industry is the largest single source of employment in the Island and accounts for one-third of the total number of jobs, the population shows an inveterate aversion to field work on estates. The stigma which attaches to field work may have its origins in the

coercive/....

1. A statement by the Mauritius Chamber of Agriculture on Decasualisation and Reclassification etc. Op.cit. App. A p(v).

coercive system of labour organisation on the early plantations[1] and the subordinate status of the labourer in the plantation society ..." the feeling of being excluded from the system."[2] This adverse attitude to manual work can also be explained by the poor promotion prospects for members of the agricultural labour force. Only one out of twenty-four labourers can aspire to become a sirdar (gangman)[3]. Generally field work on estates is considered by the labourer as strenuous and degrading and goes against his aspirations and expectations.[4] Luce, Meade, Balogh and others have laid stress on the disinclination of many persons to work with their hands and their strong preference for urban jobs and particularly Government employment. That attitude is not particular to Mauritius and is commonly found in other developing countries.[5] "This leads to the paradoxical existence side by side of unemployment and shortage of labour. A considerable proportion of people registering at the exchanges are in search of Government employment only and are unwilling to do other work."[6] We have explained elsewhere[7] that the preference for Government jobs on the part of the agricultural labour force does not have only social and psychological causes but can also be explained by economic motives or as Todaro puts it: " ... rural-

urban/...

1. See above Chapter 2, pages 63-65.
2. Chambre d'Agriculture de l'Ile Maurice: Problèmes de Main d'Oeuvre dans l'Industrie Sucrière en 1976: Op.cit. Ch 3, p.30 (translated from French).
3. Idem: Ch 4, pp.42/43. See also Chapter 3, page 205.
4. D Ah-Chuen 'et al': An Investigation of Factors Relating to Absenteeism ... Op.cit. Ch 2,p.25.
5. Absenteeism among sugar estates labourers, the abandonment of agricultural work and the aging of the agricultural population have also been reported in Guyana, Trinidad, Guadeloupe, Réunion and other places.
6. J E Meade 'et al': op.cit. Ch 4, pp.60/61.
7. Economic factors behind the workers' preference for Government employment and the withdrawal of labour from the sugar industry have been analysed in Chapter 3, pp.189-196.

urban migration is stimulated primarily by rational economic considerations of relative benefits and costs mostly financial but also psychological."[1,2]

Apart from the social stigma and lack of motivation, the aversion to field work, may also be explained by the nature of the work and working environment. A study of the data regarding the rate of crop time absenteeism on individual estates for the period 1974 to 1979, shows that some estates have generally high rates of absenteeism among their labour force while other estates experience relatively low rates of absenteeism. A classification of estates in the Island in relation to the rate of absenteeism among their labour force over the period 1974 to 1979[3] shows that Highlands estate was first, i.e. with the lowest rate of absenteeism, in five years out of six. Union estate was once first, once second, twice third, once fourth and once fifth.

TABLE 52/....

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1. M P Todaro: Economics for a Developing World, Ch 14, p.222.
2. "Absenteeism among cane cutters ... is nothing more than a form of withdrawal of these workers from the job. The acute shortage of labour met ... during crop time constitutes another symptom of an ailment which ... is prevalent in the sugar industry as a whole... Both labour shortage and absenteeism in the sugar industry represent definitely an expression of withdrawal from the job. (An Investigation of factors relating to absenteeism, op.cit. Ch 3, p.37.
3. Estates were ranked from 1 to 22 or 23 (except in 1979 when data for only 19 estates was available) the estate with the lowest rate of absenteeism being ranked first.

T A B L E 5 2 : Absenteeism / Among Agricultural Workers at Cutting and Loading (per cent of total Estate Labour Force)

Ranking of Estates	1974	1975	1976	1977	1978	1979
St Antoine (N)*	18.3 (9)**	21.4 (9)	17.5 (2)	19.4 (4)	21.4 (13)	22.3 (14)
Union (S)*	16.7 (3)	19.1 (4)	19.1 (4)	18.4 (2)	17.7 (1)	16.8 (5)
Beau Champ (E)*	15.7 (2)	20.4 (7)	19.5 (5)	24.7 (15)	22.4 (16)	16.3 (3)
Highlands (C)*	14.0 (1)	15.4 (1)	14.2 (1)	18.3 (1)	19.0 (3)	20.5 (12)
Beau-Vallon (S)*	26.1 (22)	31.9 (22)	28.2 (21)	28.6 (20)	21.8 (14)	22.3 (14)
Mon Trésor (S)*	20.6 (13)	31.1 (21)	30.2 (22)	29.9 (21)	33.2 (22)	28.7 (19)
St Félix (S)*	22.2 (20)	22.7 (13)	27.3 (19)	30.2 (22)	25.8 (20)	21.9 (13)
Total number of estates	23	22	22	22	22	19

SOURCE : Mauritius Sugar Producers' Association

* Letters (N), (S), (E) and (C) refer to the location of the estate in the North, South, East and Centre of the Island.

** Figure in brackets refers to the rank of the estate.

At the other end of the scale we find Mon Trésor estate, three times last and twice second from last, Beau-Vallon estate, twice last and once second from last and St Félix estate once last and once second from last and twice third from last. Climate, topology and location may thus explain a good deal of the difference in the rate of absenteeism between estates. Highlands estate is situated in the cool Central Plateau and in a densely populated urban region; on the other hand, Beau-Vallon, Mon Trésor and St Félix are located in the more remote parts of the Island. Besides, in the case of Beau-Vallon and St Félix between 30 and 50% of the land consists of fairly steep slopes.

Economic theory asserts that at a given wage rate, the supply of labour will depend on the marginal disutility of work. Thus the supply of labour - the number of labourers that are willing to work at a given wage and the amount of work they are prepared to do - can be expected to vary in different regions and at different times. Absenteeism is a common method by which a worker can adjust his supply of labour within the context of an established working week.[1] It may also be, as we have seen above[2], a symptom of the disinclination of labour towards field work. Data on the rate of absenteeism on estates in the Island show not only a certain measure of consistency between individual estates, as shown above, but also a fairly pronounced seasonal pattern as well, the rate of absenteeism being lower during the first

part of/....

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1. The difference in the nature and causes of absenteeism in developed and developing countries is analysed in the Appendix.

2. Page 335, Footnote 2.

part of the crop than during the second part.[1]

The supply of labour - the amount of work people are prepared to do for a given wage - will vary in accordance with the amount of time and effort required to perform a given task in different localities, in other words, there are high cost and low cost regions with regard to the supply of labour. Thus location and topography may have an important influence on the supply of labour to the estates.[2]

Proceeding from another direction, it seems reasonable to expect that there will be an increase in the marginal cost of labour on estates as the rate of employment increases. The cost of labour in this case includes not only the wage rate but also the cost of transport and other ancillary expenditure. As the rate of employment increases the cost of these expenditures, is likely to increase. In support of this assertion we have the following extract from the comments of the Chamber of Agriculture on the Luce Report:

"The/...

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1. See above page 329, Table 51.

   Over the period 1974 to 1978, a rank correlation of estates in respect of absenteeism for successive years gave the following results: For the first half of the crop (July to September), the value of the correlation coefficient (R) was: between 1974 and 1975, 0.5217; between 1975 and 1976, 0.5898; between 1976 and 1977, 0.8360 and 1977 and 1978, 0.7857. The critical value of R, at the 5 per cent level of significance, is 0.4277.

   For the second half of the crop, the correlation coefficients were :R 74, 75, 0.6798; R 75, 76, 0.4418; R 76, 77, 0.4910; R 77, 78, 0.1801. These results show a significant correlation between estates with regard to the rate of absenteeism during the first part of the crop season, but much less correlation during the second part.

2. In their analysis of the causes of absenteeism at Bel Ombre Sugar estate, Ah-Chuen 'et al' have suggested that the wage rate should be determined in accordance with topography: "A drive to reduce absenteeism and increase productivity in the Bel Ombre area will depend heavily on the company's ability to provide differing financial and non-financial incentives according to the topography of the fields." (AH-Chuen 'et al': OP.Cit. Ch 3, p.46).

"The basic assumption is that labour is plentiful and knocking at the door of the employer. The truth is that, up to now, many employers find it impossible to get all the labour they want in crop time and often have to recruit labour from far away even within the intercrop season."[1] The cost of transport of labourers on estates, which is an important determinant of labour supply, represents a significant part of the wage bill. In 1974, the cost of transport of field labour amounted to 6% of the cost of wages and salaries of the estate field labour force. If we add the cost of transport, both in terms of the actual cash outlay and the amount of time spent in travelling to work, to the wage paid, this will increase substantially the labour cost. Alternatively, if labour had to provide its own transport, we would expect that, given the importance of transport cost in total labour cost, estates would find increasing difficulties in obtaining additional labour as the distance from work increases. We can thus establish intuitively that the supply curve of labour both to the individual estate and also to the industry as a whole will have a positive slope. In other words the cost of labour increases as the rate of employment increases. We now consider another important factor which may influence the conditions of supply of labour on estates and in the industry generally: namely the importance of alternative employment opportunities hence the reserve price of labour.

The Reserve/....

1. The provision of transport for labourers working on estates is subject to a two-mile limit, i.e. within a radius of two miles around the factory itself the transport is not provided, facilities are given beyond that limit. According to Ah-Chuen 'et al' the problem of transport is a major cause of absenteeism among labourers.

(iv) The Reserve Price of Labour

Many persons in Mauritius have more than one source of income. It is a characteristic feature of the labour market in this Country. In 1972, a survey was made of the sugar cane planters in order to obtain quantitative information about them and their methods of cultivation.[1] A representative random sample of 1,208 planters was interviewed and it was found that 606 were working as labourers; of these 265 worked as agricultural labourers for other planters and 141 as relief workers. If the selected sample is representative of the whole population of 30,000 small planters who cultivate less than 100 arpents of cane,(the category covered by the survey), it would imply that in 1972 about 6,600 planters worked as labourers for other planters. The 1962 Commission of Inquiry, quoting Labour Department figures for 1961, put the number of labourers working for small planters (with plantations of between 10 and 100 arpents) at 10,350 in March 1961 and 14,050 in September 1961, i.e. an average of 12,200 labourers. According to our own estimate based on the acreage harvested by planters cultivating between 1 and 100 arpents,[2] the average number of labourers employed by these planters amounted to 11,271 (say between 10,500 and 11,500), which is not far from the Labour Department 1961 figure. On the basis of these figures we can assume that

presently/...

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1. Survey of sugar cane planters and their production pattern. Ministry of Agriculture and Natural Resources. March 1973.

2. Acreage distribution of planters land was obtained from the Reports of Sugar Insurance Fund Board. The figure of .20, for the rate of employment of "outside" labour per arpent on small plantations is the one used by the Mauritius Chamber of Agriculture in its 1976 Report to calculate the annual labour cost of small planters.(a)

   (a) Chambre d'Agriculture de l'Ile Maurice: Problèmes de Main d'Oeuvre dans l'Industrie Sucrière, Ch 5 p.56.

presently between 50 to 55 per cent of the labourers - 6,600 out of an estimated total of about 12,000 labourers - are also cane growers. Besides working for other planters, they also provide a large part of the supplementary labour force on estates.[1] Nor is this occupational diversification confined to the casual labour force. Members of the permanent labor force as well have secondary occupations, and after completing the day's work on the estate will often put in a few extra hours either working on their own plots or helping a neighbour with his crop.

The same diversity of occupations found among the casual labourers today, prevailed in the fifties and sixties when these casual labourers made up the bulk of the estates labour force. Evidence of this can be obtained from the reports of the Chamber of Agriculture. In its statement on the Luce Report, to which we have already referred,[2] the Chamber expressed its opinion that casual labourers turn to sugar estates during the harvest "because there is then a larger demand for labour and because the type of work then required ... is more remunerative than their normal occupations, such as market gardening, fishing, masonry etc. to which, however, they quite naturally revert when the sugar campaign is over." Meade[3] noted that there were in 1958 about 12,000 planters who cultivated two arpents or less and did

not need/...

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1. For a definition of the term, see Chapter 5, Part I, p.317. The additional labour force employed on estates during the 1969 to 1974 crops (average of the beginning and end-of-crop figures) averaged 3,261. Chambre d'Agriculture de l'Ile Maurice: Problèmes de Main d'Oeuvre dans L'Industrie Sucrière: Ch 1, p.11.
2. A statement by the Mauritius Chamber of Agriculture on Decasualisation and Reclassification. Annual Report for 1959/60: Op.cit. App.A p.(v).
3. J E Meade "et al": The Economic and Social Structure of Mauritius: Op.cit. Ch 4. pp.61/62.

not need to hire outside labour. They, however, hired themselves out for work on estates during the crop season. According to him they would account for the difference between the number of workers employed by the sugar industry during the crop and intercrop. The point is that the large majority of such planters cultivating uneconomical plots of two arpents or less must seek alternative employment to supplement their income from cane. Before the establishment of a regular field labour force on sugar estates, there was thus much overlap between the small planters and the casual labourers and this situation may have had an important influence on the supply of labour on estates.[1]

(iv) Unemployment in the Agricultural Sector

The level of unemployment has an important influence on the conditions of supply of labour and the stability of the labour force. We have seen above that the disinclination of labour to do a particular work will affect both the rate of labour supply to that occupation - cane cutting and loading for example - and the rate of absenteeism. If people have a strong aversion for a particular work they have to be coerced into or lured to that type of occupation and their attitude may have a determinant influence on the

rates paid/...

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1. A simple theoretical analysis of the behaviour of the farmer as (i) producer and (ii) labourer, will be found in C E Ferguson and J P Gould: Micro-Economic Theory, Ch 15, pp.426-434.

A theoretical and empirical analysis of the influence of land distribution on the supply of agricultural labour and rural wage rates, based on a general equilibrium model of rural wage determination, will be found in M R Rosenzweig, 1978*. This study highlights the influence of land distribution on the demand for and supply of rural labour. Although the model was constructed for the Indian agricultural labour market, it can be generalised to suit conditions in the labour markets of other developing countries.

* M R Rosenzweig: Rural Wages, Labour Supply and Land Reform: A.E.R. Vol 68. No.5 December 1978.

rates paid for the job. On the other hand, the better the alternative job opportunities available, the higher will be the opportunity cost of labour, the higher its supply price and the higher the rate of labour turnover.[1] According to J Stiglitz,[2] the rate of unemployment is an important determinant of the rate of labour turnover.

There remains therefore one more factor to consider in our analysis of the conditions of labour supply in the sugar industry: namely the rate of unemployment and underdevelopment in the Island generally and the agricultural sector in particular. A survey was undertaken in March 1958, which showed that 31,001 persons or 15.1 per cent of the economically active population was unemployed.[3] The industry group with the largest volume of unemployment was agriculture with 8,542 workers or 27.5 per cent of total unemployed population and 10.3 per cent of economically active persons in that group. The survey also inquired into the amount of underemployment in the Island, an underemployed person being defined as one who had worked for less than 30 hours or 4 days during the survey week but would have

liked/....

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1. "It is plausible that the level of unemployment is an important factor in the level of absenteeism. Under full employment workers are less afraid of taking days off. They assume that ... other jobs are open to them." (D Ah-Chuen 'et al': Op.cit. Ch 1 p.12).

2. J Stiglitz: Alternative theories of wage determination and unemployment in LDCs: the labour turnover model. Op.cit. pp.197, 198. See also Chapter 3, page 146, footnote 2.

3. The survey was undertaken at the height of the intercrop season and the relatively large number of unemployed and underemployed reflects to some extent the seasonal nature of work in the sugar industry. In fact of the 31,000 reported unemployed in March 1958, 27% stated that they had worked 20 days or more each month during the previous crop (September to December 1957). R W Luce: Report to the Government of Mauritius, op.cit. Table X, p.63.

liked to have worked longer. 20,477 persons, or 9,98 per cent of the economically active population, were underemployed by that definition. Of these 13,655 were working in agriculture, 18,4 per cent of the number of persons employed in agriculture at the time of the survey. These figures indicate severe unemployment and underemployment among the agricultural labour force in the Island in 1958.[1]

Although the number of permanent unemployment may not have been excessive, there was clearly at the time much seasonal unemployment or underemployment in the Island and consequently a large reserve pool of labour during the intercrop season which was available for work in the sugar industry when required. During the crop the conditions on the labour market differ radically from the intercrop conditions. The crop season is a busy time throughout the Island and besides the sugar industry, other sectors like transport and communications, trade and services, which are also subject to seasonal fluctuations in activity, are working to capacity; it is also a peak period for the small cane planters, who provide much of the additional labour force employed by the industry during the crop.

In these conditions there is a sharp drop in unemployment and underemployment and the labour market becomes relatively scarce, the conventional (neo-classical) postulates apply and the level of employment and earnings are determined not by the availability of work, as in a situation of surplus labour but by the deliberate choice of the workers.

Recent/...

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1. According to the Family Budget Enquiry of 1962, however there were only 183,500 people in the labour force and the number of unemployment was 11,300 during the harvest period and 15,000 between the crops or 7½% and 9½% respectively. If the occupational distribution of unemployment is the same as in the Luce report, this would give a figure of 4,125 unemployed in agriculture during the intercrop or 5% of the economically active persons in that group, half of the previous figure.

IV. Recent Developments in the Labour Market

Finally a reference to recent developments in the labour market may highlight some of the points mentioned above and particularly the influence which the presence of a large reserve pool of casual labour may have had on the conditions of supply of labour in the industry. The creation of the relief work programme in 1965, and more recently the establishment of the Development Works Corporation as part of the Government crash employment programme, and developments in the tea industry with the establishment of the Tea Development Authority, have led to the large scale withdrawal of casual workers from the sugar industry[1] into Government sponsored, labour - intensive projects. This has radically altered the conditions of supply of labour in the industry by providing important alternative outlets for workers in the casual labour force.[2]

Before 1972, there existed in the agricultural sector a large reserve pool of underemployed labour and estates and small planters had no difficulty in finding the additional labour required to meet the seasonal peak demand for labour during the crop season. After 1972, however, as a result of the rapid expansion of Government activities, there was a substantial drop in the amount of casual labour available for employment in the industry.[3]

The opening/....

1. The Mauritius Chamber of Agriculture: Report on the Problem of Labour Shortage in the Sugar Industry, 1973, p.8.
2. See Chapter 3, pages 189-196.
3. The Mauritius Chamber of Agriculture: Report on the Problem of Labour Shortage in the Sugar Industry, op.cit. p.8.

The opening of new employment opportunities, which were destined in theory to provide temporary relief for the unemployed, led in fact to a substantial withdrawal of labour from the traditional (rural) occupations and gave rise to acute labour problems for both large and small cane producers. Large producers traditionally relied on a seasonal labour force to meet the additional labour requirements during the crop while casual labourers made up virtually all the wage labour force on small plantations. The effect of the increasing competition from Government-sponsored work projects was felt as early as 1972 and gave rise to serious labour shortages which unduly delayed the crop operations in that year.

The shift of labour from its traditional occupations into public employment has resulted in an artificial scarcity of labour in agriculture and the virtual disappearance of the casual cane cutter. As a result both large and small producers have been facing increasing difficulties in harvesting their cane crop.[1] Besides small producers have had to pay well in excess of the rates stipulated in the Remuneration Orders to secure the required amount of labour.[2]

Thus the/....

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1. Labour difficulties have led to a drop in the tonnage of cane sent to the mills and the number of crushing hours during the crop, as shown below:

	1971	1972	1973	1974	1975*	1976	1977	1978
Total cane crushed (000 tons)	5255	6315	6242	5965	4316	6402	6022	6260
Net crushing hours per day	20.39	20.28	20.32	20.22	16.78	19.05	19.27	19.50

* Cyclone year.

SOURCE: Annual Reports of the Mauritius Sugar Industry Research Institute.

2. Chambre d'Agriculture de l'Ile Maurice: Problèmes de Main d'Oeuvre: Op.cit. Ch 5 p.54

Thus the establishment of public work projects, after the creation of a regular labour force and decasualisation of field work on sugar estates[1] has considerably reduced the seasonal underemployment among the agricultural workers, and brought certain important changes in the agricultural labour market. Added to the natural disinclination of people towards agricultural work, the prospects of a less exacting and relatively better paid and more secure work in the public sector,[2] enticed many of them away from agricultural employment. This combination of factors accelerated the withdrawal of labour from agriculture into new secondary and tertiary occupations.[3]

A Casual Labour Force

In the preceding pages we have analysed the demand for and supply of labour on estates. Our purpose was to explore the conditions which existed on the sugar industry labor market prior to Government intervention as a prelude to the study of the effects of Government regulation on the sugar estate labour force. On the demand side, the data show that seasonal factors exert a strong influence on labour productivity as measured by changes in the classification of labour, and rates paid, especially during the intercrop. On the supply

side/....

1. See above Chapter 5, page 317.
2. In his analysis of the influence of land reform on labour supply in rural India, Rosenzweig has shown that an increase in the demand for labour in the non-agricultural sector draws labourers from farming (and raises rural wage rates), although all but two of the coefficients of the non-farm variables were not significant (at 10% level). M R Rosenzweig, op.cit. p.860.
3. See above Chapter 3, page 206 for a discussion of the concepts of the effective wage rate. Even though wages paid by the Development Works Corporation or Tea Development Authority may be lower than the rates paid for comparable work in the sugar industry, the ratio of earnings to output may be superior in the former than in the latter.

side, there would appear to be certain inherent differences in the conditions of labour supply between individual estates, due to topography, location and climate, which result in certain estates having relatively high and others relatively low labour costs. Recently, other factors, particularly the competition from the new labour-intensive projects administered by the Development Works Corporation, the Tea Development Authority or Government itself, have created an artificial scarcity of labour in the industry.

But apart from these factors, the system of labour recruitment on estates - especially the casual nature of employment of a large part of the labour force - may have had an important influence on the determination of wages. As we have seen above,[1] the large majority of field workers at the time was employed on a daily basis; half of them were recruited and paid directly by estates; the other half by job contractors. It is the last category of workers which constituted the casual labour force.

In his Theory of Wages,[2] Hicks gives the following description of the casual labour market. In that market "though the demand of employers is continuous in the sense that practically everyday each employer has some men working for him, it is not regular since the number of men which he employs fluctuates incessantly. A large proportion of the labourers, therefore, cannot count with any assurance at all of being taken on again by the same employer when their period of contract has expired."

By its very/....

1. See above Chapter 5, Part I pages 331/332
2. J R Hicks: The Theory of Wages: 2nd edition, Ch IX pp 66/67.

By its very nature, this type of market is very competitive as labourers are very mobile moving habitually from one establishment to another. Hicks argues that wage rates tend to be stable because of "this intense competitiveness combined with the deferred action of wage changes on the supply of labour".[1] In that case changes in the conditions of demand and supply would be reflected in greater or less regularity of employment for the individual labourer, rather than in a change in wage rates. Hicks adds that wage rates on casual labour markets fall more easily than they rise, this being due to the familiar fact that while it is very easy to become a casual labourer, it is much more difficult to stop being one ... "Thus although a considerably increased demand for casual labour must raise wages, the effect may well be belated and possibly small."[2]

The agricultural labour system on estates in the fifties and early sixties contained some of the salient features of the casual labour market described by Hicks. That could account for the inherent wage stability which characterised the sugar industry labour market where for eighteen years - between 1939 and 1957 - there was, as we have seen before,[3] no appreciable increase in real wages in spite of a rapid expansion of sugar production in the Island. It leads also to the conclusion that negotiations between individual estates and job contractors may have had a greater influence on the determination of wages than the operation of impersonal market forces. In these conditions the rates tend to be determined on an "ad hoc" basis in relation to a specific task, and the conventional forces of demand and supply lose

much of/...

1. J R Hicks: The Theory of Wages: 2nd edition, Ch IV, p.67.
2. Idem, p.69.
3. See Chapter 5 Part I pages 313 and 314.

much of their significance for the analysis of wage determination in these markets.

APPENDIX III

APPENDIX TO CHAPTER 5 - PART I :

NATURE AND CAUSES OF ABSENTEEISM

In conventional economic theory, absenteeism is seen as the way in which workers in regular employment can adjust their supply of labour in accordance with their leisure - preference function. (Lipsey: Introduction to Positive Economics, 3rd edition, Ch.26 page 339). This may provide a plausible explanation for the high incidence of absenteeism among coal miners or factory workers in Britain. But the causes of absenteeism may be different between developed and developing societies. The following extract is taken from an article by A Kamarck in Finance and Development[1]: "In developed countries, it can be assumed that the average economic man is healthy and that sickness, while not insignificant, is not normally a major factor in the growth and functioning of the economy. But in today's less developed countries in the tropics this assumption is false. In such areas a person who has not been, or is not being substantially affected by poor health is the exception; and lack of good health affects attitudes to work, learning ability and energy and capacity for sustained work or thought". This statement is followed by some figures regarding the prevalence of diseases in tropical Africa. It may be argued that what may be true of tropical Africa may not apply to Mauritius and other more salubrious parts of the developing world and one can point to the striking differences in the death rates between countries like Ghana, Nigeria, Zambia on the one hand and Mauritius, Jamaica and Trinidad on the other.

TABLE 53/...

1. A Kamarck: Finance and Development June 1973 Vol.10 Number 2 page 5.

TABLE 53 : Crude Death Rates: Average 1973-77 (o/oo)

Jamaica	7.1*	
Trinidad	6.7*	
Mauritius	7.8	
Nigeria	22.7	These figures are based on estimates prepared by the Population Division of the UN and relate to 1973-75
Ghana	21.9	
Zambia	20.3	

* Average: 1973-76

SOURCE: United Nations Demographic Year Book

It is true that there may be large differences in the death rate or life expectancy or the state of public health among developing countries but differences in nutritional standards may not be so striking and an inadequate diet can affect attitudes and performance at work as much as a high rate of morbidity.[1] The calorie and protein intake of the average person in Mauritius compared with his counterpart in developed and developing countries is given in Table 54.

This information is taken from a Report of the Chamber of Agriculture on labour problems in the sugar industry.[2]

TABLE 54 : Calorie and Protein Intake

Regions	Energy (calories/hd)	Proteins (grams/hd)
Developed Countries	3,110	94
Developing Countries	2,240	58
Africa	2,160	56
Mauritius	2,300	46

SOURCE: Chambre d'Agriculture de l'Ile Maurice - Problèmes de Main d'Oeuvre dans l'Industrie Sucrière.

See Footnotes (1) and (2) next page.

According to the Chamber's Report the theoretical daily requirement of the average Mauritian male worker is 4,000 calories and 100 grams of protein.

According to Reynolds and Gregory,[3] the most important single source of absenteeism in Puerto Rico is health difficulties of the worker and members of the family. Out of a sample of 1,045 manufacturing workers it was found that 476 reported a total of 716 absences during the two months before the interview. Forty-two per cent of the reasons given were personal illness and another ten per cent invoked illness in the immediate household. Reynolds and Gregory add that it is not surprising to find a high incidence of indisposition in a country in which the nutritional level is low and in which diets favour foods with high carbohydrate content over those with mineral and vitamin values. A low resistance to disease and fatigue are reasonable consequences. Other causes of absenteeism noted by Reynolds and Gregory were: the traditional obligations to family members (death, weddings etc. in the family or neighbourhood and other ties and obligations within the extended family).

The causes of crop time absenteeism among field labourers in the sugar industry in Mauritius are given in Table 55.[4]

TABLE 55/...

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1. D AH-Chuen 'et al': Op.cit. Ch 3 p.40. The authors mention a number of references in support of their assertion. "The importance of nutrition factors in productivity cannot be overstressed. It has been shown that men surviving on 1800 calories a day loose up to 30% of their muscle strength and up to 15% of their precision of movement. Mental alertness, coordination of movements, speed of movement, bodily resistance to heat and rain have also been shown to be affected when the calories intake falls short of the required minimum. Improvements in inadequate diets have been shown to increase work output and to decrease absenteeism."
2. Chambre d'Agriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre dans l'Industrie Sucrière: Op.cit. Ch 2, p.15.
3. L.G Reynolds and P Gregory: Wages and Industrialisation in Puerto Rico: Op.cit. Part II ~~of~~ Ch.5 pp.161/162.
4. The figures on absenteeism in Puerto Rico relate to workers in manufacturing plants whereas the figures for Mauritius relate to the sugar industry field labour force.

TABLE 55 : Causes of Absenteeism in the Sugar Industry for the Whole Crop

	1974	1975	1976	1977	1978	1979
Accident at work	5.6	3.3	3.0	3.5	3.2	1.6
Sick leave	15.7	16.4	15.0	13.7	16.5	11.1
Local leave	0.6	0.7	1.4	1.9	2.4	3.9
Non-authorised and undetermined	78.1	79.6	80.6	81.9	77.9	83.4
	100	100	100	100	100	100

SOURCE : Mauritius Sugar Producers' Association.

Bearing in mind that manufacturing workers in Puerto Rico and agricultural workers in Mauritius live and work in very different environments it can be said that, by and large, the factors which account for the high rate of absenteeism in Puerto Rico also apply in Mauritius: poor health due to bad nutritional habits and inadequate diets, and social obligations. In its Report[1] the Chamber of Agriculture expressed the opinion that poor health and fatigue due to malnutrition are an important cause of absenteeism among agricultural labourers in the Island. This does not mean that the other causes of absenteeism are unimportant. In both Puerto Rico and Mauritius the rate of absenteeism is relatively higher on Saturdays and Mondays; as one Puerto Rican employer put it: "They (Workers) spend Friday getting ready for the festivities of the week-end and Monday recovering."[2] Overdrinking at week-ends and cinema-going may account for an important percentage of absences in both countries. But poor health is also an important, if not the most important, cause of absenteeism in these countries, much more so than in developed countries.

It appears/...

1. Chambre d'Agriculture de l'Ile Maurice: Problèmes de la Main d'Oeuvre, ibid Ch 2, pp.14-21.
2. L G Reynolds and P Gregory: Wages, Productivity and Industrialisation in Puerto Rico. Op.cit. Ch 5, p.164.

It appears that absenteeism in the context of developing countries generally may be different both with regard to its nature and causes from that of industrialised societies. In the former it will be more prevalent among low-wage workers and tend to diminish as wages rise and diets improve,[1] whereas in high-wage societies, an increase in wage rate may increase the rate of absenteeism.[2]

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1. Evidence for Puerto Rico shows that absenteeism rates are negatively related to plant wage levels ... higher income frequently, perhaps typically, result in improved worker attendance and performance. L G Reynolds and P Gregory: Op.cit. Ch 5, pp.164/165.

2. There may be another reason militating against the connection between absenteeism and leisure-preference in the case of workers in poor countries. In most people's mind leisure is associated with pleasure and entertainment. All forms of entertainment involve both goods or services and leisure. As Galbraith once said, "all the good things of life are enjoyed at leisure."(a) It can thus be argued that when an individual absents himself from work he does not choose leisure "per se" but all the good things that go with it. Entertainment opportunities are very limited for workers in poor countries and there is very little pleasure or utility in absenting from work, if it means staying in a dingy overcrowded room which is the lot of most people in these countries or whiling away long, idle hours on the road side.

   (a) In an interview by F Cairncross of the "Observer".

GOVERNMENT MINIMUM WAGE LEGISLATION IN THE SUGAR INDUSTRY

P A R T I I

The Analysis of Labour Productivity on Estates

This part of the work will study the productivity of labour in the sugar industry. We believe that questions about labour productivity, the effect of seasonality and the impact of labour legislation on conditions of employment in the sugar industry can best be studied within an explicit production function framework. Our investigation into labour productivity in the sugar industry is based on an analysis of cross sectional data for millers' estates. These data relate to two crop years: 1964/65 and 1972/73. The object of analysing the estate production statistics for those two years is to determine the changes which may have occurred during that period in labour productivity and in the methods of production as a result of Government labour policy. For that purpose it is necessary to select periods which are broadly comparable, as far as available data will permit. Both 1965 and 1973 crops produced an exceptionally large tonnage of cane; 1965 had a production of 5,984,000 tons of cane. It was the largest cane crop on record and 1973, with 5,964,000 tons of cane, was the third largest crop. Judging from the high cane tonnage produced, climatic conditions would appear to have been fairly similar in both years. The choice of 1964/65 as the reference year is also significant as it was the first year after the passing of the wage regulation orders for the sugar industry labour force and marked the transition from the old system to the new order with regard to the conditions of employment of labour on estates.

The data/...

The data for 1964/65 cover twenty-four estates: that for 1972/73, 23 estates. All inputs except land (arpents) and labour (man-days) are measured in rupees. The data for all inputs except labour was obtained from the Mauritius Chamber of Agriculture. The Chamber has detailed information on the cost of various field operations on individual estates. Information regarding the number of mandays of labour worked on each estate was obtained from the Mauritius Sugar Producers' Association. This information covered the various categories of labour employed on each estate and the quantity of each category used on each operation.

Before considering the choice of variables and the specification of the production function, we deal with a common problem faced in the estimation of agricultural production functions, namely the treatment of differences in the quality of land and labour inputs. Ignoring differences in the quality of agricultural land or labour may lead to serious errors in the estimation of the production coefficients.

We shall consider in the first place the measurement of land and the problems posed by agroclimatic differences in the estimation of a production function.

I. Measurement of Inputs

(i) Differences in Land quality, Climate, Temperature and Soil

Natural factors: temperature and humidity, wind speed and soil conditions, have an important influence on cane output. Variations in rainfall and temperature account for a large part of the changes in output from year to year; similarly changes in soil conditions in different parts of the Island

have/..

have an important bearing on yields. In the vegetative period - November to June - the growing cane requires adequate rainfall and a relatively high minimum temperature. In the maturation period, on the other hand, the ripening cane requires low rainfall and a relatively low minimum temperature. The temperature ratio - the daily range between the maximum and minimum temperature - is also important during the ripening period. Inadequate rainfall and low temperature will seriously affect cane growth while high rainfall, high minimum temperature and a low daily range will inhibit cane maturation.[1]

Changes/....

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1. In an analysis of annual changes in sugar output, the Mauritius Sugar Industry Research Institute studied rainfall and temperature data, from 1955 to 1969, and found that deviations in rainfall and temperature from the seasonal norm could account for the annual changes in output. According to the Sugar Industry Research Institute, the following factors are critical for cane growth and maturation: (1) rainfall deficits during the vegetative period and excesses during the maturation period; (2) minimum temperature and (3) relative insolation.

   The normal values for each of these factors are:

   (1) rainfall deficits during growth (i.e. the sum of monthly deficits): 15 ins and excess during maturation (i.e. the sum of monthly excesses): 2.5 ins.

   (2) minimum temperature during growth: 23.3°C and 16.5°C during maturation;

   (3) relative insolation: 58 per cent in both periods.

   Annual Report, Mauritius Sugar Industry Research Institute, 1969: pp.97-102.

Changes in climatic conditions from year to year will have an important effect on yields. This is equally true of differences between regions. For its size Mauritius has a remarkable variety of climates from the northern plain with seasonally dry conditions and severe moisture deficits to the humid or super-humid elevated central plateau.

A detailed inventory of land resources in the Island in terms of land formation, climate and soil was published some years ago by an FAO technical mission and the Mauritius Sugar Industry Research Institute in the form of a land-resources and agricultural - suitability map.[1] The map gives information about the different climatic and soil types that exist in the Island and their suitability for sugar cane and other crops. The data also contains information regarding the major natural limitations that arise in relation to each specific land use.[2] For this purpose the Island is divided into a number of land units. The land unit is part of the land surface over which the agro-climatic characteristics are fairly uniform: it is the mapping unit and was used as the basis for the classification of land for agricultural purposes. A total of 44 land units have been identified and mapped in Mauritius. Each land unit is evaluated in terms of both its actual and potential suitability for various crops, i.e. sugar, food crops, mixed cropping, tea, forestry

and/...

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2. These limitations may be due to adverse climatic and soil conditions. They are denoted in the map by means of a letter code as follows: S 3 c* t** means land marginally suitable for sugar cane because of severe moisture deficits in three or more consecutive months, and moderate slopes. The order of letters in the code reflects the relative importance of the limitations.

   * c = climate
   ** t = topography.

1. Land Resources and Agricultural Suitability, Map of Mauritius, MSIRI, Réduit 1972.

and livestock. Actual suitability refers to the suitability of the land for a particular use in its original condition, i.e. before improvements have been made; potential suitability refers to the suitability of improved land units (the required improvements are specified in each case).

This work is the most up-to-date and scientific study of agro-climatic conditions in the Island. From the information given therein, we have calculated a land quality index in an attempt to reduce or eliminate the effect of differences in land quality both within each estate and between the estates.

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When actual acreage harvested is used as a proxy for natural resources, this may give rise to serious specification errors as it does not allow for the influence of climate , land quality, etc. and these factors are known to have an important effect on yields and to vary substantially between different estates.[1] We could eliminate land quality differences

between/...

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1. With regard to the cause of the specification error - the omitted or proxy variable problem - its effect on the regression results - inconsistent and biased estimates of the coefficients - and the various possible solutions to deal with the problem, see G S Maddala: Econometrics. Ch 9, Section 9-5 and Ch 13, Section 13-8. (Tokyo McGraw Hill 1977). Maddala refers to an example given by F Welch in connection with the estimation of the effects of schooling on income. Welch argued that people have tried to get proxies for ability and other such control variables in order to overcome the bias which might occur from simple regressions of years of schooling on income - which might over-estimate the effect of schooling. But if the variables were measured with error "the game of searching for controlling variables is not without pitfalls". According to Z Griliches* the more we try to protect ourselves against various possible biases due to omitted variables, the worse we make the errors in measurement problem.
(Footnote 1 continued next page)

between estates by expressing the acreage harvested on each in standard units. However the absence of a basic unit in which the various observations may be measured and the lack of precise knowledge about the effect of quality differences on yields, means that a certain element of error must remain in the estimation procedure.

The land quality factor, or index of land quality, was calculated in the following way: A value of 0 to 3 was assigned to the different land units according to their suitability rating for sugar cane, and the land quality factor for each estate was defined as the weighted sum of the value of the various land units found on the estate, the weights being equal to the percentage of the total area occupied by individual units.

In some of the equations the land quality factor was included as a separate variable. Elsewhere it was used to convert the actual arpents harvested on each estate into standard arpents.

Details regarding the computation of the land quality factor are given in the Appendix to this Chapter.

(ii) Labour Differences

Labour is another common source of specification error in the estimation of a production function. It is an important factor

in/...

Regarding the problems raised by land quality differences in production functions, see (i) E O Heady and J L Dillon (1960): Agricultural Production Functions (IOWA State Univ. Press), Ch 5 pp.193, 194 and Ch 7, p.225; (ii) S K Nath (1974): Estimating the seasonal marginal Productivity of Labour in Agriculture. Oxford Economic Papers Vol.26 No.3 November 1974 p.377; (iii) P K Bardhan (1973): Size, Productivity and Returns to Scale: An Analysis of Farm Level Data in Indian Agriculture, Journal of Political Economy Vol.81 No.6 November/December 1973 p.1374.

* G S Maddala: Op.cit. Ch 13, p.305.

in agricultural production and particularly in cane production and the use of raw labour data unadjusted for quality differences, may lead to serious biases in the value of regression coefficients.[1] Labour productivity is also the focal point of our statistical analysis of field production on estates.

We have already considered at some length the differences in the quality of field labour in the sugar industry as reflected in the different grades of agricultural labour employed on estates.[2] To study the effect of seasonal variations on labour productivity, field labour is divided into two broad categories, male and female,[3] and the number of mandays worked during the crop and intercrop are analysed separately. Our aim is to obtain a measure of the difference in the productivity of labour during each season.

The nature and timing of field operations determines the pattern of employment of labour on estates. The main operations performed during the intercrop comprise: land preparation,[4] cane planting, fertilisation, weeding, irrigation,

transport,/...

1. Z Griliches: Specification bias in estimates of Production Functions - Journal of Farm Economics, 1957, p.8.
2. In the previous section (Ch 5, Pt I p.324) we argued that the different grades assigned to labour reflect differences in the nature of the work rather than the quality of labour. Under competitive equilibrium conditions the rates paid to different grades of labour will be equal to differences in the marginal productivity of labour.
3. Detailed labour data for each estate are available for 1972/73 but not for 1964/65. We could not therefore differentiate between male and female labour for the earlier period. As there would appear to be important differences in the productivity of male and female labour the use of a combined labour figure may affect the 1965 regression results and their comparability with those of 1973. On the other hand there is a high degree of correlation between intercrop male and female labour which could partly explain the poor statistical results obtained when these variables are analysed separately.

transport, land clearing, earthing up and repairs to bridges, roads and drains. Crop time field work consists of the following operations: trashing, cutting, loading and transport. Most operations are performed by both men and women concurrently, although certain tasks are essentially done by men (cutting and loading) while others are done almost entirely by women (trashing). The percentage of male and female labour employed on different field operations in 1972/73 is given in Table 59(b)(at the end of the Chapter). For land preparation and cane planting, the overall percentage of men employed is 66%; it varies between 45 and 78 per cent on individual estates. Fertilisation is done essentially by women; on about half the estates, 80 per cent or more of the labour force employed on that operation consists of women. For ordinary (routine) weeding women make up half to two-thirds of the total labour force. On the other hand chemical weeding (i.e., the preparation and spraying of herbicides) is almost exclusively done by men. Trashing is mainly done by women, and for land clearing after cutting, women make up 90 per cent or more of the labour force. Other field work comprise repairs to bridges, roads, and canals and miscellaneous operations.[5] Men make up eighty per cent or more of the labour force employed on these operations. Overall men represent two-thirds to three-quarters of the field labour force employed on estates.[6] In order to aggregate

labour of/...

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4. Land preparation comprises derocking, sub-soiling, furrowing and holing. Most of this work is now done by machine.
5. Miscellaneous operations comprise "assolement", the preparation of scum, forking, recruiting and other work related to cane cultivation.
6. See Table 59(b)at the end of this Chapter.

labour of different quality, some economists have taken the differences in the wage rate paid to each category as representative of differences in their marginal productivity and used these wage differences as a weighting factor in order to standardise the different grades.[1]

(iii) System of Payment of Field Labour

It may be useful to describe briefly at this stage the system of payment of field labour on estates. Field labour is paid on a piece or task rate basis with a minimum daily rate which is prescribed by law. Each labourer, or team of labourers comprising both men and women, is set a task to do. The task is measured in terms of "gaulettes" - an old agrarian measure which is used in the sugar industry.[2] The size of the task varies substantially in different regions and between different operations. The rate paid for a particular task is determined by the field manager, his assistant, or the sirdar or gangman. It is based on the estimated amount of work to be done; i.e. on the average number of "gaulettes" that can be covered in a normal day's work by each category of labour, the estimated cost of the operation and the statutory minimum wage.

The basic daily rates for men and women in 1973 were as follows:

Field/.....

1. See J L Bridge: Applied Econometrics - North-Holland Publishing Company 1971, Ch 6, §6.6, p.342.
2. One arpent = 800 to 900 gaulettes, depending on field conditions: rockiness, slope etc. ...

Field labourers basic daily rates:	Men	Rs 9.00
	Women	Rs 5.15
	Youths	Rs 5.00
	Children	Rs 3.85

For example the cost of cane planting operations on a particular estate has been put at Rs 53.76 per arpent. To earn her basic minimum wage of Rs 5.70, a woman labourer must do in that case 85 gaulettes daily. The cane cutter for his part is paid by the weight of cane cut and loaded. If the rate is put at Rs 5.57 per ton, the labourer must cut 1.6 tons daily in order to earn his minimum wage.

Given the minimum wage prescribed for different categories of labour the apportionment of field work between them is based on simple economic considerations. The basic wage of a female worker is 55.6 per cent of that of an adult male. There are many operations like cane planting, fertilisation, trashing and clearing after cutting, where it would be difficult for a man to accomplish 75 per cent more work than a woman in the same number of hours.[1] In economic theory the profit maximising principle requires that the ratio of marginal products of various factors should be equal to the ratio of their prices. In this specific case, the high percentage of women employed on estates in fertilisation, trashing and clearing after cutting, reflects the relatively higher productivity of women as compared with men in these

operations,/...

1. The difference between the stipulated basic daily rates for men and women in 1974 was Rs 3.95; the male wage was 75 per cent higher than the female wage. On many estates, the task done by women in cane planting, fertilisation, weeding, trashing and land clearing was more than 60 per cent and sometimes as much as 80 per cent of the male task. SOURCE: Information obtained from returns sent by individual estates.

operations, given the difference in the stipulated wage between the two categories of labour.

The MSPA has detailed records of the amount of work done by each category of labour - male, female and youth - on estates in 1972/73. We tried to standardize these labour inputs by using as conversion factor the ratio of female to male wages. It was pointed out to us however,[1] that women are very often relatively more efficient than men at the prevailing wage. This would mean that differences in the average productivity of male and female labour do not match the wage differentials between them.[2] Alternatively we tried to adjust the labour data in terms of the task set to the different categories of labour. A letter was sent to a number of sugar estates asking for information about the daily task done by men, women and youths in respect of different field operations. From the replies received however no clear pattern emerged which could be used to compensate for differences between the different categories of labour. We finally decided to incorporate female labour as a distinct variable into the production function, in order to ascertain whether it exerts an influence on output which differs significantly from that of male labour. It appears from an analysis of the data that female labour is not a perfect complement or substitute for male. But the correlation coefficient is very high especially between intercrop male and female labour. There is thus evidence of a strong degree of multi-collinearity between

the two/....

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1. By the Director of the Mauritius Employers Federation.
2. In his article on Statutory Minimum Wage Fixing in the Sugar Industry of Mauritius Chesworth writes that the principle of equal pay for equal work was not applied with respect to women workers.*

   * D P Chesworth: Statutory Minimum Wage Fixing in the Sugar Industry of Mauritius. Op.cit. p.10.

the two labour categories. This will affect the stability and reliability of the results.[1]

Putting aside these statistical problems for the time being, we can say from a cursory examination of the labour data, that there are certain tasks on estates that are predominantly male and others predominantly female but the actual percentage employed of each category depends to a large extent on regional or local factors which tend to vary substantially between different estates.

(iv) Specification of Capital Inputs

The value of the non-labour inputs used by estates is calculated on a calendar year basis; while the crop year generally extends between July of the preceding year and June of the following. Strictly therefore the expenditure data kept at the Mauritius Chamber of Agriculture relates to two different crops. In order to convert this data from a calendar year to a crop year basis, we averaged the amount spent by estates on each item in 1972 and 1973.

With regard to the classification of capital inputs, Heady[2] prescribes two general principles (in order to minimise the specification error in aggregation).

(a) The inputs within an individual category should be as nearly perfect substitutes or perfect complements as possible; i.e. these inputs should be used in fixed proportion.

(b)/...

1. Regarding the problem of multi-collinearity and its effect on the estimates of the regression coefficients, see pages 384/385.

2. E O Heady and J L Dillon: Agricultural Production Functions: Op.cit. Ch 7, p.220.
Z Griliches, 1957: Specification Bias in the Estimates of Production Functions. Journal of Farm Economics, p.19.

(b) Relative to each other, the categories of inputs should be neither perfect substitutes nor perfect complements.

The following non-labour inputs are included in the production function: weedkillers, fertilisers and land preparation. Each of these inputs comprise a number of different items.[1] Expenditure on weedkillers covers the cost of chemicals, and other expenses incurred for the weeding of fields. Weeding on estates is still largely done by hand and manual weeding accounts for a large part of the total number of mandays worked in the fields during the intercrop season. The combination of chemical and manual weeding varies between different estates, chemical weeding being more extensively used in the humid and super-humid regions. The relationship between hand weeding and chemical weedkillers gives rise to problems of interpretation to which we shall return later.[2]

The cost of fertilisers includes the value of scum, molasses, manure and chemical fertilisers but excludes labour costs incurred in their preparation and application. Items included under land preparation consist mainly of agricultural machinery services: the cost of spares parts and other charges for maintenance and repairs (excluding labour), fuel and lubrication, insurance and depreciation. On certain estates, the cost of machinery services

is spread/....

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1. The cost of fertilisers and land preparation used on individual estates has been obtained by adding together a number of items. This is the common procedure. However, the arithmetic sum of these inputs introduces bias in the estimates, unless they are used in fixed proportions. Bias can be reduced by using as the aggregated input, not the arithmetic sum of the inputs but their geometric sum, i.e. their product.

   E O Heady and J L Dillon: Op.cit. Ch 7, p.228.
   Z Griliches: Specification Bias in the Estimates of the Production Functions: Op.cit. pp.18/19.

2. See below, p.394.

is spread among different field operations: land clearing, destoning, furrowing, subsoiling, while on other estates agricultural machinery services are treated as a separate and specific item of cost. It was therefore necessary to amalgamate the cost of agricultural machinery services with other cultivation charges. Land preparation also includes the cost of replanting: the cost of purchase, preparation and planting of cane cuttings (always exclusive of labour). All these cost items were grouped into a single input category called land preparation.

In the cost returns submitted by estates, depreciation on various items of cultivation was calculated on the gross book value of the assets. But, in these days of rapid inflation, this does not reflect accurately the cost of the service provided by the asset. In making provision for its replacement, it becomes necessary to take into account the rapid increase in the price of the asset - its replacement value. Depreciation at replacement value has been included in the cost of capital inputs in the production function. The Chamber of Agriculture calculates annually the total cost of depreciation of different capital items used on millers' estates. We apportioned that amount among individual estates on the basis of information obtained from a Census of Agricultural assets carried out in December 1971, which gives full details regarding the number, make and size of agricultural machines and other implements on each estate.[1]

Limitations/...

1. There are many differences in the type and size of equipment (i.e. horse power capacity) used on individual estates but these differences were not taken into consideration in this exercise.

(v) Limitations of the Data

In an attempt to measure the changes which have taken place over time in the productivity of labour and other inputs and the impact of the new labour laws on the efficiency of field work on estates, a production function was also fitted to data for the 1964/65 crop in order to compare the results with those obtained from the 1972/73 crop. Unfortunately all the statistical information which is available for 1972 and 1973 could not be obtained for 1964 and 1965. The detailed labour returns were missing for some estates, while data compiled by the Chamber of Agriculture before 1965 did not differentiate between labour and other charges in the costing of various field operations. Consequently in calculating the value of capital inputs, we had to use the 1965 data only instead of the average for 1964 and 1965. In other words the value of these inputs was calculated on a calendar year rather than a crop year basis as was the case for 1972/73.

Finally depreciation charges for 1965, in respect of all field equipment are based on the historical cost of assets as it was not possible to convert them to a replacement value basis.[1]

The Form of the Production Function

The aim of a production function is to describe in the form of a mathematical model the nature of the relationship between a

number of/...

1. Those were years of relative price stability. Virtually all of the field equipment used on estates is imported. Between 1961 and 1967, the import value index of machinery and transport equipment rose by 13 percentage points from 91 to 104 (1964 = 100). By contrast, between 1969 and 1975, it rose by 162 percentage points, from 130 to 292 (1965 = 100).

number of inputs or independent variables and a certain output. The choice of a specific form of production function implies certain assumptions and constraints. Fundamentally the objective is to achieve the greatest possible accuracy in the definition of the actual relationship between different variables, given the quality of the data and computational constraints within which we must operate. The choice of function poses both a technical and statistical problem. Technically the form of the function must be consistent with the phenomena under investigation. This implies a good knowledge of the relation between inputs and output, of the nature and the logic of production process and the importance of various inputs. The chain of causation may be particularly complex in a biological process like sugar cane where each stage in the operation may have a determinant influence on the other stages. In that case one may well ask whether the production process can be satisfactorily represented by a single equation model implying a unidirectional causal relationship between inputs and output or whether these variables are so interdependent that the process can only be represented by a system of simultaneous equations.[1]

Next/...

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1. Inputs used in agriculture are not independent of one another, i.e. irrigation and fertilisers or fertilisers and weedkillers. Moreover the quantity used of certain inputs is jointly determined with cane output, e.g. weeding.(a) Each operation must be done at the right time and in the right sequence and the right quantity of inputs applied at each stage. If the quantity used is inadequate, this will affect the productivity of other inputs as well. Besides these inputs are not applied concurrently but consecutively and this fact should be reflected in the specification of the model.

   If single equation models (and the least squares method of estimation) are used in a situation where there is more than one dependent variable, and consequently more than one equation, the estimation of the function will be inconsistent.(b)

   On the other hand the use of simultaneous equation models in regression analysis is much more complex than single equation ones. As a practical matter, "... single equation estimates have generally been found to be just as logical and meaningful in an economic sense as those derived at much more expense by the use of simultaneous equation models."(c)

(Footnote continued next page)

Next arises the question of the statistical adequacy of the overall function. The methods of statistical testing of the results are well known. They are based on the value of the adjusted coefficint of multiple determination ($\bar{R}^2$) and the 'F' ratio. These provide an easy way of determining how far the particular function chosen 'fits' the data, i.e. what proportion of the variance is explained by the explanatory variables. Because of the relatively small number of observations we used the adjusted coefficient $\bar{R}^2$ instead of R^2.

In the quantitative analysis of field production on estates, I have tried linear and Cobb-Douglas forms of functions. A linear model has serious shortcomings when used to describe the production of an agricultural crop like sugar cane. It implies that the inputs are independent and additive in the sense that the removal of one or more factors will not affect the contribution of the other factors or that the contribution of a single factor in isolation will not be different from its contribution when combined with a number of other factors. This does not reflect the logic of agricultural production, where natural, biological and economic elements are closely intertwined in a complicated web of causation. It also implies that, if an input is at all profitable, it should be applied in unlimited quantities. All the same it was considered useful to obtain linear estimates of the parameters of the production function.

The Cobb-Douglas/...

(a) The coefficient of weedkillers had a negative sign in all the regression equations. This negative sign may be explained by the influence of a hidden common factor, rainfall, on the relationship between weedkillers and cane output. (See below pp 394/395).

(b) For a simple introduction to the subject of simultaneous equation models, see D Gujarati: Basic Econometrics: Op.cit. Ch 16, part 4.

(c) E O Heady and J L Dillon: Agricultural Production Functions: Op.cit. Ch 6, p.202.

The Cobb-Douglas, multiplicative type of production function, is the most common and most popular form of production function used in empirical work. It is useful and convenient and when expressed in log form is transformed into a linear function, which is very convenient computationally for the estimation of the regression coefficients by the ordinary least squares method.[1] The "b" coefficient or exponent of the C.D. function is the elasticity of production and can then be used directly. The use of a C.D. type of function however imposes various constraints on the research worker and implies certain assumptions regarding the characteristics of the production process. These constraints and assumptions are: the C.D. function allows either constant, increasing or decreasing marginal productivity but it does not allow an input-output curve which can accommodate all three situations. It assumes a constant elasticity of production over the entire input-output curve - i.e. the parameters are constant over the entire range of output. Furthermore the value of the C.D. function restricts the substitution between factors such that the elasticity of substitution is always unity.[2] A curve plotted from a single-variable C.D. function will "flatten out" as output increases over the entire range of input values and a maximum point is not defined.[3] The equation further assumes that each resource is limitational and that output is zero, when an input, any input, is of zero magnitude.

The notations/...

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1. A consideration of the problems posed by the use of the least squares method for estimating regression coefficients will be found in Z Griliches: Specification and Estimation of Agricultural Production Functions - Estimates of the Aggregate Agricultural Production Functions: Opcit. p.421.
2. For proof of this proposition, see J L Bridge: Applied Econometrics, op.cit. Ch 6, p.326.
3. Economic theory provides certain restrictions on the general shape of the (neoclassical) production function. Where only one good is produced with only one piece of capital and one type of labour the marginal products of each factor are expected to be positive and decreasing. Besides as one factor

The notations used, and the equations are given below:

Notation:

Y_c = Tonnage of cane produced

C = Constant

A = Arpents harvested

CLM = Crop Labour Male

CLF = Crop Labour Female

ICLM = Intercrop Labour Male

ICLF = Intercrop Labour Female

CLT = Crop Labour Total

ICLT = Intercrop Labour Total

W = Value of Weedkillers and Herbicides (excluding Labour costs)

F = Value of Fertilisers (excluding labour costs)

P = Value of Agricultural machinery services used for land Preparation and Replanting

QFL = Land Qualify Factor

The following equations were used in connection with the 1973 data:

$$(1)\quad Y = C_1 + a_{1,1} A + a_{1,2} CLM + a_{1,3} CLF + a_{1,4} ICLM + a_{1,5} ICLF + a_{1,8} W + a_{1,9} F + a_{1,10} P + a_{1,11} QFL + e_1$$

$$(2)\quad Y = C_2 + a_{2,1} A + a_{2,6} CLT + a_{2,7} ICLT + \ldots + a_{2,10} P + a_{2,11} QFL + e_2$$

$$(3)\quad Y = C_3 + a_{3,1} A^* + a_{3,2} CLM + a_{3,3} CLF + \ldots + a_{3,10} P + e_3$$

(4)/...

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is increased, output should approach a limit. The C.D. function satisfies the first two conditions (positive and decreasing marginal products) but not the third one. J L Bridge: Op.cit. Ch 6, pp.324-326.

$$(4)\quad Y = C_4 + a_{4,1} A^* + a_{4,6} CLT + a_{4,7} ICLT + a_{4,8} W + \ldots + a_{4,10} P + e_4$$

$$(5)\quad \text{Log } Y = C_5 + a_{5,1} \text{Log } A + a_{5,2} \text{Log } CLM + a_{5,3} \text{Log } CLF + \ldots + a_{5,10} \text{Log } P + a_{5,11} \text{Log } QFL + e_5$$

$$(6)\quad \text{Log } Y = C_6 + a_{6,1} \text{Log } A^* + a_{6,2} \text{Log } CLM + a_{6,3} \text{Log } CLF + \ldots + a_{6,10} \text{Log } P + e_6$$

$$(7)\quad \frac{Y}{A} = \frac{C_7}{A} + a_{7,1} + a_{7,2} \frac{CLM}{A} + a_{7,3} \frac{CLF}{A} + \ldots + a_{7,10} \frac{P}{A} + a_{7,11} QFL + e_7$$

$$(8)\quad \frac{Y}{A} = \frac{C_8}{A} + a_{8,1} + a_{8,6} \frac{CLT}{A} + a_{8,7} \frac{ICLT}{A} + \ldots + a_{8,10} \frac{P}{A} + a_{8,11} QFL + e_8$$

Equations (9) and (10) are similar to equations (7) and (8) respectively, but with adjusted arpents[1] and omitting the land quality variable.

$$(11)\quad \text{Log } \left(\frac{Y}{A}\right) = C_{11} + a_{11,1} \text{Log } A^2 + a_{11,2} \text{Log } \left(\frac{CLM}{A}\right) + a_{11,3} \text{Log} \left(\frac{CLF}{A}\right) + \ldots + a_{11,11} \text{Log } QFL + e_{11}.$$

$$(12)\quad \text{Log } \left(\frac{Y}{A}\right) = C_{12} + a_{12,1} \text{Log } A + a_{12,6} \text{Log } \left(\frac{CLT}{A}\right) + a_{12,7} \text{Log} \left(\frac{ICLT}{A}\right) + \ldots + a_{12,11} \text{Log } QFL + e_{12}.$$

Equations (13) and (14) are similar to equations (11) and (12) respectively, but with adjusted arpents and omitting the land quality variable.

The following/...

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2. The coefficients of A, in the log equations (11) to (14), (21) and (22) provide a test of constant returns to scale; see below p. 387.

1. For an explanation of the term "adjusted arpents", see p.375.

The following equations were used with the 1965 data:

(15) $Y = C_{15} + a_{15,1} A + a_{15,6} CLT + a_{15,7} ICLT + a_{15,8} W + a_{15,9} F + a_{15,10} P + a_{15,11} QFL + e_{15}$

(16) $Y = C_{16} + a_{16,1} A^* + a_{16,6} CLT + a_{16,7} ICLT + a_{16,8} W + a_{16,9} F + a_{16,10} P + e_{16}.$

(17) $\text{Log } Y = C_{17} + a_{17,1} \text{Log } A + a_{17,6} \text{Log } CLT + a_{17,7} \text{Log } ICLT + \ldots + a_{17,10} \text{Log } P + a_{17,11} \text{Log } QFL + e_{17}.$

Equations (18) is similar to equation (17) but with adjusted arpents and omitting the land quality variable.

(19) $\frac{Y}{A} = C_{19} + a_{19,1} + a_{19,6} \frac{CLT}{A} + a_{19,7} \frac{ICLT}{A} + \ldots + a_{19,10} \frac{P}{A} + AFL + e_{19}.$

(20) Similar to equation (19) but with adjusted arpents and omitting the land quality variable.

(21) $\text{Log}(\frac{Y}{A}) = C_{21} + a_{21,1} \text{Log } A + a_{21,6} \text{Log}(\frac{CLT}{A}) + a_{21,7} \text{Log}(\frac{ICLT}{A}) + \ldots + a_{21,10} \text{Log } (\frac{P}{A}) + a_{21,11} \text{Log QFL} + e_{21}.$

(22) Similar to equation (21) but with adjusted arpents and omitting the land quality variable.

In equations 1,3, 5, 6, 7, 9, 11 and 13, male and female labour are treated as separate inputs, in the other equations they are combined into a single category. In equations 3, 4, 6, 9, 10, 13, and 14, 16, 18 and 20 the number of arpents harvested on each estate is adjusted for quality differences, by multiplying the actual number of arpents by the land quality index. This is indicated by an asterisk. In the other equations the land

quality/...

quality index is included as an additional independent variable. Equations 1 to 4, 7 to 10, 15, 16, 19 and 20 are linear and the other equations are all in double log. form. Finally to reduce multicollinearity, in equations 7 to 14 and 19 to 22, all inputs have been divided by the number of arpents harvested for each observation. Equations 1 to 14 relate to the 1973 data, while equations 15 to 22 relate to 1965. The 1965 data does not differentiate between male and female labour.[1] Otherwise the 1965 equations are similar in form and specification to the 1973 ones.

Before proceeding with the analysis of the data and interpretation of the results, there are a few preliminary observations to make regarding the choice of the production function and general problems associated with the estimation of aggregate production functions from cross-sectional data.

III. Problems of Estimation

(i) The choice of the function: As we have seen above, in the choice of the form of the function a primary consideration relates to the logic of the production process and its adequate representation by means of a particular mathematical model. One of the main short-comings of the Cobb-Douglas function is that it allows either constant, increasing or decreasing marginal productivity but does not allow an input-output curve embracing all three. Given the mathematical properties of the model, this form of function cannot be used satisfactorily for data where there are ranges of both increasing and decreasing marginal productivity. An

initial/...

1. See above p.369.

initial question we must ask ourselves is whether the use of a C.D. function is consistent with the conditions of cane cultivation on estates in Mauritius.

Cane cultivation on estates is very intensive by any standard.[1] Years of research, in cane technology and the intensive use of fertilisers have brought the sugar estates to a high pitch of technical efficiency. The intensive nature of cane production on estates implies diminishing returns and the yields obtained on estates from the increased use of fertilisers and weedkillers support this assertion.[2] In these conditions the use of a C.D. function should not be incompatible for the analysis of the cane production on estates.

(ii) The Unit of Observation

This point relates to the choice of individual estates as production units for the production function. In the estimation of aggregate production functions from cross-section data the choice of the production unit gives rise to important technical problems and determines to a large extent the reliability and usefulness of the results.[3] If the data

used/...

1. Sugar Cane Production: Area harvested, Yield and Production in Selected countries (Average 1961-1975)

	Harvested (1000 HA)	Yield (kg/HA)	Production (1000 MT)
Mauritius	81	67,190	5,515
Réunion	42	48,743	2,039
South Africa	182	81,691	14,877
Cuba	1,426	35,620	50,488
Jamaica	63	63,043	3,949
Trinidad	35	55,223	1,935
USA	284	81,318	22,791
Philippines	417	50,010	20,891

Of the eight countries listed above, Mauritius comes third after South Africa and USA with respect to cane yield.

SOURCE: FAO Production Year Book, 1975.

Footnotes 2 and 3: See next page.

used in the analysis come from a wide range of different firms or farms, this may give rise to serious specification errors in estimation because of quality differences and problems of interpretation. This point relates to the possibility of fitting an aggregate function to different firms or industries using different technologies. Data used in aggregate cross-section studies should as far as possible refer to units that have similar technology.

In our case the choice of millers estates as units of observation was dictated by the availability of data. The only abundant and accurate collection of production statistics in Mauritius relates to millers estates and there is very little information regarding other production units in the sugar industry (large and small cane producers). The level of technology, management and organisation is quite comparable between individual estates although there are substantial differences between them regarding the acreage under cane or factory capacity.[4] Besides the labour regulations apply only to the estates and large and medium cane planters.[5] But the large and medium planters account for a relatively small percentage of the wage labour force in the sugar industry. So it is reasonable, that, in the analysis of the effect of these measures on the productivity of field labour, we should concentrate on the millers estates. For all that, the choice of the

estates/...

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2. Reports on field trials with fertilisers and weedkillers will be found in the Annual Reports of the Mauritius Sugar Industry Research Institute .
3. J L Bridge: Op.cit. Ch 6 §6.4, p.366.
4. This may give rise to problems of heteroscedasticity to which we shall return later.
5. Planters producing more than 1,000 tons of cane.

of the estates may give rise to problems of identification, which we shall now consider.

(iii) The Identification Problem

As stated before, the coefficients of the production function have been estimated by means of a single equation model. This model implies certain assumptions, the crucial one being that the determining variables are independent of one another and of the error term, in other words that the inputs and outputs are not jointly determined. In sugar cane production certain inputs may be determined by output or other inputs: i.e. fertilisers and weedkillers, crop time labour and the output of cane. In that case the assumption of zero correlation between the explanatory variables and the error term is not tenable and the use of a single equation model and ordinary least-squares method for the estimation of the production function would result in inconsistent and biased estimates of the parameters.[1]

According to Griliches, the problem of simultaneity is also important not so much because of the possibility of bias in the estimates of the coefficients but because of the possibility that no sensible estimates could be had by any technique. "The important question is whether nature has performed a well-designed experiment, an experiment that would allow us to observe and estimate the effects of a change in inputs on output. If all firms faced the same prices, had the same production function and maximised profits, they would be all at the same point and we could not estimate anything. Even if they are not all of the same point, it is important

to specify/...

1. D Gujarati (1976): Basic Econometrics Tokyo, McGraw-Hill, Ch 16, pp.342-344.

to specify why they are not. This is rather difficult to do for a group of similar farms in a restricted locality, the usual source of data for farm production functions."[1]

The point raised by Griliches is also mentioned by J L Bridge[2] in these terms: "If we consider a number of firms each with the same production function and ... perfect competition and knowledge is assumed, then at any point of time when prices are fixed, each firm will produce exactly the same amount. If we were trying to estimate the production function from this cross-section, the task would be impossible ..." Bridge adds that the model is too restrictive, for different firms have different outputs and inputs even when confronted with the same set of prices. If we maintain the perfect competition assumption - i.e. firms face fixed prices of factors and outputs - but introduce a random variable (or disturbance term) into the production function to allow for differences in the technical and economic ability of entrepreneurs which are assumed to be distributed randomly around the typical firm's ability; Bridge shows that if the data relate to cross-section observations over firms, we have then a simultaneous system without exogeneous variables to help identification. However if relative prices vary exogeneously over the sample then the necessary condition for identification of the behavioural equations is satisfied.[3] Thus it would appear that in a neoclassical world of profit maximising firms, relative factor prices play an essential role in the estimation of

production/....

1. Z Griliches: Specification and Estimation of Agricultural Production Functions. Estimates of the Agricultural Production Function from Cross Sectional Data. p.422.
2. J L Bridge: Applied Econometrics: Op.cit. Ch 6, p.335.
3. Idem, p.340.

production functions from cross sectional data. How far do relative factor prices differ between the estates in Mauritius? We show below that there are "genuine" differences in the relative price of labour on different estates due to differences in the quality of cane produced on these estates, hence in the price of cane.[1]

To calculate "w," the average cost of labour - we divided total labour costs on each estate by the number of mandays worked. Women and youths were converted into equivalent adult male workers by multiplying the number of mandays supplied by women and youths by .57, which represents the ratio of the stipulated female to male wage.[2] The logic behind this procedure is that where work is relatively more suitable for women and where it would be difficult for the men to accomplish a 75 per cent larger task than the women in the same number of hours, the work is generally assigned to women.[3] Thus the high percentage of women employed in land clearing, fertilisation and trashing reflect their relatively higher productivity in those operations, given the basic wage differential between these two categories of labour.

All estates receive a uniform price for their sugar. But the price of cane (p) on each estate will depend on the total

amount/....

1. By the relative price of labour we mean the average cost of labour - which is taken here to be 'synonymous' with the wage rate - divided by the price of cane.
2. The basic rates for men, women and youths in 1973 were as follows: men : Rs 9.00 Women : Rs 5.15 Youths : Rs 5.00
3. Regarding the use of wage differentials as a weighting factor, to eliminate differences in labour quality, see S K Nath, Op. cit. Oxford Economic Papers p.378.
See also Chapter 5, Part I, page 363.

amount of sugar obtained from cane multiplied by the price of sugar. Cane quality (the amount of sucrose in cane) varies between different estates. Hence the price of cane will vary exogeneously between these estates and the necessary condition for the identification of the production function will be satisfied. In expressing the value of the cane crop in terms of the amount of sugar produced, we must also take account of the fact that all the estates do not produce sugar of the same quality. Some estates produce partly white and partly raw sugar, and others only raw sugar. The amount of sugar produced on each estate has been adjusted for those quality differences by converting the actual amount of sugar produced into the equivalent amount of sugar at 96^{o} Pol. The average price of sugar in 1973 (price to producers) was Rs 833.50 per ton. The value of $\frac{w}{p}$ for each estate is given below.

From the results we can see that the ratio $\frac{w}{p}$ varies between .063 and .114. There is therefore no uniformity in the ratio of the wage rate to the price of cane - that is in the relative price of labour as defined above[1] - between estates in 1973. The estimates of the marginal product of labour from regressions 9, 10, 13 and 14 are as follows:[2]

Regression	9	CLM	2.86
	10	CLT	.48
	13	CLM	.57
	14	CLT	.38

There is no/...

1. Page 381.
2. The estimates of the marginal products of labour are calculated for their mean values; in the linear equations, these estimates are obtained directly from the regression coefficients; for the log. equations we used geometric mean ratios to calculate the marginal product.

Estate (1)	Average wage paid for field operations ($\frac{W}{L}$ = w) (2)	Sugar recovered (%) cane (3)	Price per ton of cane (3) x price of sugar (4)	($\frac{w}{p}$) (5)
			Rs	
Medine	6.7	12.77	106.45	.063
Solitude	7.4	11.37	94.78	.078
Beau Plan	7.8	12.20	101.70	.076
The Mount	8.8	11.77	98.11	.090
Belle Vue	8.7	11.71	97.61	.089
St Antoine	8.1	11.18	93.20	.086
Mon Loisir	8.8	11.56	96.36	.091
Constance	9.2	11.53	96.11	.096
Union Flacq	8.7	11.66	97.20	.090
Beau Champ	8.3	11.38	94.86	.087
Riche-en-Eau	7.7	11.95	99.61	.077
Mon Tresor	8.6	12.96	102.20	.084
Savannah	9.2	12.65	105.45	.087
Rose-Belle	9.6	11.71	97.61	.098
Britannia	9.6	11.73	97.78	.098
Union St.Aubin	8.95	11.66	97.20	.092
St. Felix	10.4	10.97	91.44	.114
Bel Ombre	8.1	11.70	97.53	.083
Reunion	8.8	11.49	95.78	.092
Highlands	9.3	12.45	103.78	.090
Mon Desert Alma	9.7	12.21	101.78	.095
TOTALS AND AVERAGES		11.83	98.61	

There is no apparent relation between the estimates of the marginal product of labour and the relative price of labour.

Having disposed of the identification problem we now turn to two other problems commonly encountered in regression analysis: problems of multi-collinearity and heteroscedasticity.

(iv) Multi-collinearity and Heteroscedasticity

The term multi-collinearity refers to a sitation where, because of strong inter-relationship among the independent variables, it becomes difficult to disentangle their separate effects on the dependent variable.[1] It is a fundamental assumption of the linear regression model that there is no multi-collinearity among the explanatory variables. If there is perfect multi-collinearity, in the sense that there is an exact linear relationship between two or more of the independent variables, the regression coefficients of these variables are indeterminate and their standard errors are infinite. If multi-collinearity is high but less than perfect it may be possible to estimate the regression coefficients but these estimates will have large standard errors, and cannot therefore be estimated with precision or accuracy. Besides the estimates of the coefficients and their standard errors become very sensitive to even the slightest changes in the data.

The problem of multi-collinearity may be due to the lack of sufficient information in the sample to permit the accurate estimation of the individual parameters.[2] A common symptom

of/...

1. For a simple treatment of multi-collinearity in regression analysis and the problems to which it gives rise, see D Gujarati: Op.cit. Ch 9, and G S Maddala: Op.cit. Ch 10.
2. Since the independent variables (the "x" variables) are assumed to be fixed or non-stochastic, multi-collinearity is a sample regression phenomenon. When we postulate the theoretical or population regression function (P.R.F.), we believe that all the "x" variables included in the model have a separate or independent influence on the dependent variable Y. But it may happen that in any sample that is used to test the PRF, some or all the "x" variables are so highly collinear that we cannot isolate their individual influences on Y ... In short our sample may not be rich enough to accommodate all the "x" variables in the analysis. (D Gujarati: Op.cit. Ch 9, p.173.)

of multi-collinearity is when the regression equation gives a high $\bar{R}^2$ and zero - order correlations are also high, but none or very few of the partial regression coefficients are individually statistically significant on the basis of the conventional "t" test.[1] When we regressed the total tonnage of cane produced against the acreage harvested, the quantity of crop and intercrop labour emloyed etc, in equations (1) to (6) and (15) to (18), we obtained high $\bar{R}^2$ and 'F' ratios but only a few of the regression coefficients were statistically significant. Besides there was a high inter-correlation between most of the independent variables.[2] Clearly we face a serious problem of multi-collinearity in those equations as acreage harvested will determine both the tonnage of cane produced and the total quantity of labour and total value of weedkillers, fertilisers etc, used in production.

Therefore in equations (7) to (14) which relate to the 1972/73 crop data and (19) to (22), for the 1964-65 crop, we divided all the variables by arpents harvested and regressed the tonnage of cane per arpent on the quantity of labour, the value of weedkillers and fertilisers, etc, all expressed on a per-arpent basis.

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Another common problem encountered with cross-sectional data is that of heteroscedasticity.[3] This term refers to cases which violate another fundamental assumption of least squares

estimators,/...

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1. G S Maddala, Op.cit. Ch 8, pp.122/123 and D Gujarati, Ch 9, pp.181/182.
2. High zero-order correlations are a sufficient but not a necessary condition for the existence of multi-collinearity. See D Gujarati: Op.cit. Ch 9, p.182 and G S Maddala, Ch 10, p.185.
3. For an introduction to the problem of heteroscedasticity, see D Gujarati: Op.cit. Ch 10 and G S Maddala, Op.cit. Ch 12.

estimators, namely that their residuals have an equal variance.[1] In the presence of heteroscedasticity, the estimates of the regression parameters are still unbiased and consistent but inefficient,[2] and the O.L.S. method will underestimate the true standard error of the regression coefficient.[3]

The original 1973 data was tested for heteoscedasticity - by means of the Park test,[4] but the results did not show a significant relation between any of the explanatory variables and the error term.

In order to reduce the effect of multi-collinearity, we deflated all the variables for each observation by the number of arpents harvested, in regressions 7 to 14 and 19 to 22. However in the case of linear regressions, if the original equation involves a constant term we should not estimate a regression with just the deflated variables.[5] We should add the reciprocal of the deflator - in that case the reciprocal of "arpents harvested" (A) - in the equation as an extra variable. Once we have obtained the regression coefficients by this procedure, we can multiply each side of

the/...

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1. Symbolically this assumption can be expressed as $E(u_i^2) = \sigma^2$ for all i, see D Gujarati: Op.cit. Ch 10, p.193.
2. For a definition of these terms, see D Gujarati, Op.cit. Ch 10 p.197.
3. It will therefore overestimate the 't' value of the estimated coefficient.
4. To detect heteroscedasticity in the data we used the following formula $\ln e_i^2 = \alpha + \beta \ln X_i + v_i$
   where e_i^2 is the square of the estimated residual, used here as a proxy for σ_i^2
   X_i is the explanatory variable
   v_i is the stochastic disturbance term,
   following the procedure outlined in D Gujarati, op.cit, Ch 10, p.203. The results did not show any significant relation between e_i and any one of the explanatory variables in the original regression.

the equation by A so that the coefficient of 1/A becomes the estimated constant and the constant becomes the estimated coefficient of A.[6] The results of equations 7 to 10, 19 and 20 were obtained in this way.

In the double log equations 11 to 14, 21 and 22, as well, all the variables were divided by acreage harvested. The Cobb-Douglas function imposes constant returns to scale, i.e. it restricts the sum of elasticities with respect to all inputs (including arpents harvested) to be equal to one.[7] We therefore tested these equations for constant returns to scale by including the log. of arpents harvested (A) in these equations as an extra variable.

(v) The Reason for This Procedure[8]

Suppose we have the following Cobb-Douglas production function:

$$Q = cK^{\alpha} L^{\beta} D^{\gamma},$$

where K stands for the value of capital services, L for labour services, D for arpents harvested and C is a constant. α, β and γ represent the coefficients of output elasticity with respect to capital (K), Labour (L) and Land (D). This function assumes constant returns to scale (C.R.S.). We want to test this hypothesis. Further to reduce multi-collinearity,

we divide/...

5. The constant term in the original regression becomes a variable once it is deflated by the number of arpents harvested.
6. S K Nath, Oxford Economic Papers Vol.26, No.3, November 1974, p.379.
7. In the log regressions (5) and (6) with undeflated data the sum of input elasticities amounted to 1.09 and 1.02 respectively. In neither case was the sum significantly different from one.
8. I am grateful to Dr S K Nath for this explanation of the procedure used to test for constant returns to scale.

we divide each of the inputs by the number of arpents harvested for each observation. Dividing all variables by arpents harvested gives:

$$\frac{Q}{D} = C\left(\frac{K}{D}\right)^{\alpha} \left(\frac{L}{D}\right)^{\beta} \times 1$$

The D term is reduced to 1 because $\left(\frac{D}{D}\right)^{\gamma} = 1$. Taking logs of both sides we obtain:

$$\text{Log}\left(\frac{Q}{D}\right) = \text{Log } C + \alpha \text{Log}\left(\frac{K}{D}\right) + \beta \text{Log}\left(\frac{L}{D}\right), \text{ since log of } 1 = 0.$$

We assume constant returns to scale. In that case $\alpha + \beta + \gamma - 1 = 0$. We now introduce into the equation: $p = \alpha + \beta + \gamma - 1 = 0$. The regression equation becomes:

$$\text{Log}\left(\frac{Q}{D}\right) = \text{Log } C + \alpha \text{Log}\left(\frac{K}{D}\right) + \beta \left(\text{Log } \frac{L}{D}\right) + p \text{ Log } D + e,$$

where e is the error term. We test for C.R.S. to see whether p is significantly different from zero. We followed this procedure in equations 11 to 14, 21 and 22. In these equations the number of arpents harvested (A), was included alongside other inputs. All the other inputs were divided by acreage harvested. In none of these equations was the coefficient of A significantly different from zero. Thus the use of a double log function with deflated variables would appear to be justified by these results.

IV. Analysis of the regression results

We now turn to a detailed analysis of the regression results. Table 56 gives the ordinary least-squares estimates of the coefficients obtained from the analysis of the estates field data for the 1972/73 crop. In the linear regressions 1 to 4 we used undeflated data. These results are subject to serious multi-collinearity. As we have said above, in face of multi-collinearity it is difficult to obtain precise or stable estimates of the coefficients. This could explain the high

standard/...

standard errors of the estimated coefficients in regressions 1, 2, 5 or 6, where only two coefficients out of nine or ten are statistically significant (at the 5% level).

In equations 7 to 14 all the variables were divided by arpents harvested to reduce multi-collinearity. Equations 1 to 4 and 7 to 10 are linear and the other equations are in double-log form.

(i) Labour

We begin with labour; for our fundamental purpose is to assess the seasonal variations in labour productivity and the constraints which it imposes on the stabilisation of wages and employment in the sugar industry.

The coefficient of male crop labour is always highly significant[1] in all regressions in which it appears as a separate variable. The coefficient of male intercrop labour is not significant in any equation. The coefficient of female crop and intercrop labour are not significant in any of the regressions. Female intercrop labour is also highly correlated with male intercrop labour in regressions 1 to 6; besides in regressions 5, 7 and 11, the coefficient has a negative sign.

As male crop labour and male and female intercrop labour are highly inter-correlated, we combined male and female labour in regressions 2, 4, 8, 10, 12 and 14. The coefficient of

combined/...

1. Unless otherwise indicated, the terms significant, highly significant or very highly significant will be used as follows: significant means above 2.5% but below 5% level of probability; highly significant above 1% but below 2.5% and very highly significant below 1% level of probability.

combined crop labour is highly significant in all regressions. The coefficient of combined intercrop labour is significant at the 5% level in regressions 4 and 14 and significant at 10% level in regression 10. In these regressions the value of the coefficient of intercrop labour is half or less the value of the coefficient of crop labour.

The form of the function - linear or CD - and the choice of variables will affect the value of the coefficients. In those regressions where the acreage harvested is adjusted for differences in land quality, the value of the coefficient of male crop labour improves substantially as compared with those regressions where the L.Q.F. is included as an extra variable. (Contrast in this respect regressions 3, 6, 9, 13 with 1, 5, 7 and 11). There is some improvement too in the coefficient of intercrop labour in the regressions using adjusted arpents (compare equation 4 and 2, 14 and 12). On the other hand, as we shall see below, there is a correspondingly sharp drop in the value and significance of the coefficient of arpents harvested in all the regressions using adjusted arpents in the place of actual arpents. (Contrast regressions 5, 7, 8 with 6, 9 and 10).

On the basis of these results there is in all the 1973 regressions a highly significant difference in the value of the coefficient of crop and intercrop labour. The coefficient of male crop labour is always highly significant and sometimes very highly significant, while none of the coefficients of male intercrop labour is significantly different from zero.

In our/....

In our analysis of crop data for 1964/65, we use the same functional forms (linear and C.D.) and the same independent variables as for 1973.[1] The results are shown in Table 57. There are important differences between labour results for 1965 and 1973. While the 1973 crop labour coefficient is generally highly significant in both the linear and log regressions, the 1965 coefficient is only significant once* in regression 20[2]. On the other hand, the 1965 intercrop labour coefficient is highly significant in regressions 16, 19 and 20 and significant at the 10% level everywhere else. This is in marked contrast to the 1973 results.

These changes in the results are what we would expect from the introduction of compulsory intercrop employment on estates. Before the passing of the Security of Employment Ordinance[3] which linked intercrop employment to the number of days worked during the crop, most of the labour employed on estates was casual labour mostly recruited through job contractors on an "ad hoc" basis for specific operations. The new legislation created a regular labour force on estates. The need to employ, during the intercrop, a large part of the crop time labour force induced estates to rationalise the use of labour during the crop in order to reduce their intercrop commitments. That could explain the considerable improvements in the crop labour results for 1973, and by

contrast/...

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1. Certain changes had to be made, however, in the measurement of inputs in 1965 as compared with 1973, due to the unavailability of data. See above p.369.
2. It is also significant in regression 15, but for reasons given before we should not set much store by this result.
3. See above Chapter 5, Part I, p.316 footnote 1.

* at the 10% level.

contrast, the deterioration in the results obtained with intercrop labour in that year as compared with 1965.

(ii) Arpents Harvested

We turn now to an analysis of the other results. In the regression results for 1973, the coefficient of arpents harvested is significant, at the 10% level, in regression 5 and in regression 7, but not significant elsewhere. It is not significant in any of the 1965 regressions. If we compare the results obtained from regressions 5, 7, and 8 with those obtained from the other regressions, we can see that the significance of the coefficient increases in all the regressions in which the number of arpents harvested is unadjusted for quality differences and the index of land quality figures as a separate variable. Generally it appears that we obtain better results with arpents harvested in those equations in which Q.F.L. enters as a separate variable, than in those equations where adjusted arpents are used.

The degree of intensity in the use of various factors of production will have a direct bearing on their productivity. Economic theory asserts that in a situation where there is one fixed factor (land) and one variable factor (labour), as more labour is used in production, the (implicit) marginal product of land increases symmetrically with the decline in the marginal product of labour and reaches a maximum when the marginal product of labour drops to zero.[1] This would imply

that the/...

1. When we speak of "applying" labourers to a plot of land, we can equally well speak of "applying" a plot of land to the labourers. When the marginal productivity of men declines, we can say it is because there are more men per acre, or fewer acres per man; only the proportions are important. The

that the greater the amount of labour or capital used per acre of land, the higher will be the (implicit) marginal product of land and the lower the marginal product of labour or capital. Inother words, with the labour intensive techniques of production used on estates in Mauritius,[2] one may expect a substantial difference between the marginal productivity of land and other inputs and rapidly diminishing returns to further increases in the employment of field labour.[3]

(iii) The Land Quality Factor

Before we turn to the analysis and interpretation of the results for the capital services a brief word about the Land Quality Factor (QFL). In the 1973 regressions with deflated (per acre) data, the QFL coefficient is significant in three regressions out of four. It is not significant, however, in any of the 1965 regressions. Besides as we have said above, there are important changes in the value of the coefficients of arpents harvested and crop labour if the land quality factor is treated as a separate variable or if it is used to adjust the original number of arpents for differences in soil and climate.

(iv)/...

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law of diminishing returns is completely symmetrical and it is a matter of indifference which input we hold fixed and which we vary. (George J Stigler, The Theory of Price, Macmillan 3rd Edition, Ch 7, p.125).

2. The ratio of labour to land in the sugar industry of Mauritius is much higher than in many other countries. According to Lord Campbell of Elkan, former Chairman of Booker Bros, the island uses seven times as many workers per acre as Australia and twice as many as Guyana and Jamaica. (D P Chesworth: Statutory Minimum Wage Fixing, Op.cit. p.26, footnote 1.)

3. In the regressions where the coefficient of acreage harvested is significant, its value is much greater than that of other inputs, notably male crop labour or total crop labour and fertilisers.

(iv) Weedkillers[1]

While the coefficient of weedkillers is very highly significant or significant in many of the 1965 regressions, i.e. regression equations 15, 16, 19, 20, it is, at best, only significant at the 10% level in the 1973 regressions.[2] Moreover in all the regressions the coefficient has a negative sign. This negative sign was puzzling and it was one of the reasons which led us to modify the original specification and introduce a land-quality factor. With the introduction of the land quality factor, the coefficient of weedkillers showed some improvement but retained its negative sign.

A possible explanation could be that the use of weedkillers depends on climatic conditions. It is applied more heavily in the super-humid regions than in the drier parts.[3] On the other hand, excessive rainfall can have an adverse effect on yields. We can describe the relationship between cane yields, rainfall and the use of weedkillers by means of a simple diagram as follows:

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1. This item comprises the non-labour expenses incurred on ordinary weeding (light weeds) chemical weeding (preparation and application of herbicides) and special weeding (bad weeds).

2. Chemical weedkillers are a good substitute for manual weeding in the control of weeds. As we have seen above* this close relationship may give rise to problems of interpretation. There were substantial changes in the system of weeding on estates between 1964/65 and 1972/73, with a drop of more than one-third in the amount of labour used for these operations. Weeding operations accounted for 50 per cent of the total number of man-days used on estates in 1964/65 and 45 per cent in 1972/73. The changes made in the system of weed control on estates may provide an explanation for the significant drop in the value of the coefficient of weedkillers between 1965 and 1973.
   * Chapter 5, p.367.

3. The value of weedkillers per arpent in 1973, varied from an Rs 15, on two estates in the sub-humid region to over Rs 100 on estates in the humid and super humid regions.

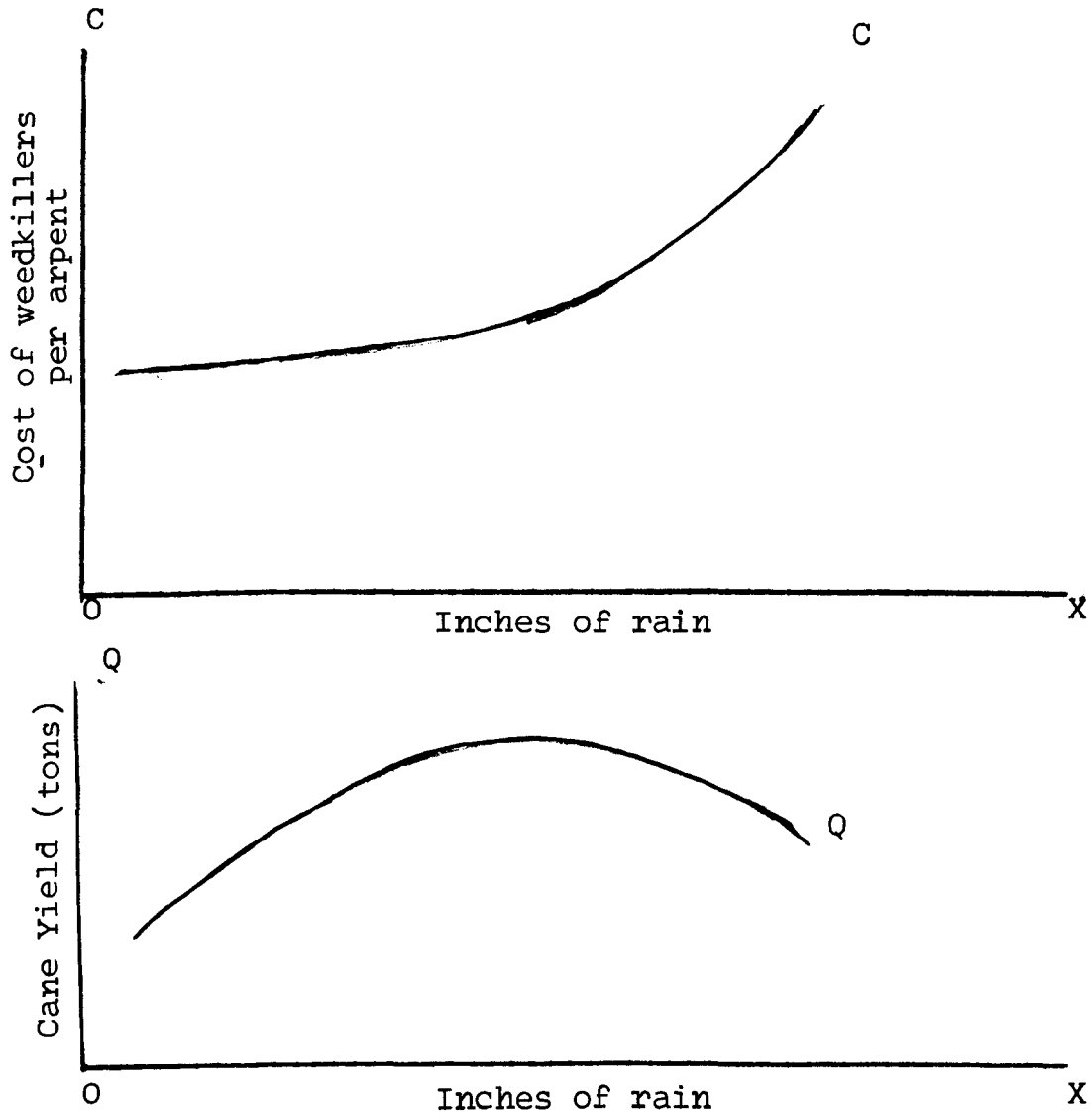

FIGURE 4 : HERBICIDES, RAINFALL AND CANE YIELDS

The curve labelled C in Figure 4 shows the relationship between the cost of weedkillers per arpent and rainfall. It is assumed to be approximately constant up to 'n' inches of rain per year and increasing beyond. The curve Q describes the relation between cane yields per arpent and rainfall. Cane yields are assumed to increase up to 'n' inches of rain per year (the curve has a positive slope) and to decline beyond.[1] This could explain the negative relationship

obtained/...

1. According to the land suitability map in eighteen cases out of forty-four, climatic conditions are the most severe limitations in the way of higher yields. Eleven cases relate to dry conditions with moderate to severe moisture deficits, while seven cases relate to super humid conditions of high rainfall and low evapotranspiration. See above Chapter 5, part II, page 358.

obtained between cane yields and the cost of weedkillers. Since rainfall has a negative influence on yields (while the cost of weedkillers increases with rainfall), beyond 'n' inches of rain per year, there will be a negative relation between the cost of weedkillers and cane output. Hence the negative sign of the regression coefficients.[1] It is interesting to note that the inclusion or omission of the land quality factor makes little appreciable difference in the value of the coefficient in both the 1965 and 1973 regressions.

(v) Fertilisers[2]

The coefficient of fertilisers is significant or highly significant in almost all the 1973 regressions, except regressions 5 and 7. In the 1965 regressions it is highly significant in regressions 15 and 16, but not significant elsewhere. The changes in specification with regard to the treatment of land quality differences had little effect on the value of the coefficient of fertilisers which remained relatively stable in both the 1965 and 1973 regressions, especially those using undeflated data. From these results it may be inferred that differences in agro-climatic conditions would appear to have had little appreciable effect on the use of fertilisers on estates.

(vi)/...

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1. In symbols the relationship between cane yields and weedkillers can be expressed as follows:

   If $\frac{dC}{dX} > 0$ and $\frac{dQ}{dX} < 0$ then $\frac{dQ}{dC} < 0$

2. The value of fertilisers comprises the cost of factory scum and molasses and chemical fertilisers. It is assumed that these items are used in the same proportion on each estate.

(vi) Value of Agricultural Machinery Services for Land Preparation[1]

The coefficient for land preparation is not significant in any of the regressions. Besides in three of the 1965 regressions the coefficient has a negative sign. This item consists mostly of expenditure on agricultural machinery services. We had a problem with the classification of the data as on some estates the cost of mechanical field work is included in the cost of other field operations while others charge all of the expenditure to a separate account. Besides on some estates mechanical work is done wholly or partly by the estates themselves while other estates hire outside contractors. Finally part of the work may be of a recurrent nature (uprooting, furrowing and replanting) and part of a capital nature (bulldozing, levelling) and the returns submitted by estates do not differentiate clearly between them. All of that may lead to substantial measurement errors and serious bias in the estimation of the coefficient for land preparation.[2]

V. Redeployment/...

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1. This item includes the value of agricultural machinery services: cost of fuel and lubrication, repairs, insurance and depreciation; other cultivation charges, planting and supplying of cane tops and preparation of cutting (excluding labour).
2. The problems to which the least squares estimation procedure gives rise when there are observational errors in the data have been analysed by G S Maddala. (Op.cit. Ch 13). Maddala considers various possibilities and examines the consequence of the measurement errors on the estimation of the coefficients in each case.

V. Redeployment of Labour on Estates

The creation of a regular labour force on estates might lead to a redeployment of labour between the crop and intercrop in an attempt to even out the demand for labour and "spread the load" of work better between the busy and slack seasons.

Before we conclude it may be interesting to consider the effect which the new labour regulations had on the organisatin and timing of field work. These regulations led to the transfer of certain operations from the busy to the slack season and an overall reduction in the amount of labour used, with the mechanisation of heavy field work and the increasing use of herbicides in the place of manual labour for weeding operations.

To measure these changes and the redeployment of labour between the busy and slack seasons, we give below in Tables 59 (a) and (b) the number of man-days worked on various field operations during each period in 1964/65 and 1972/73, respectively. These tables show the impact of the new labour laws on the organisation of field work on estates and the degree of flexibility which exists with regard to the timing of field operations.

Table 59(a) shows the number of mandays worked by men and women in July to December and January to June in both 1964/65 and 1972/73[1]. A glanceat these figures will show an important change in the relative number of people employed

and the/...

1. Separate data for male and female workers are available for June to December 1964 but not for January to June 1965 (for which only the total number of man-days worked is available).

and the amount of field work done during each period. In 1964/65, 34 per cent of the work on land preparation and planting was done during the crop season. In 1972/73, 26 per cent of the work was done during the crop. Many estates used to plant their cane in July and August and harvest them fifteen months later.[1] The new labour conditions have led many estates to abandon "petite saison" and plant all their cane during the slack season, especially on rocky land which requires comparatively more labour.

Finally there has also been a significant reallocation of labour in the case of other miscellaneous field work (repairs to roads, bridges, etc). In 1964/65 the work was spread out fairly evenly between the crop and intercrop (45 per cent and 55 per cent respectively). In 1972/73 the bulk of this work was done during the slack (intercrop) season. Table 59(b) shows the percentage of male and female labour employed on various operations in 1964/65[2] and 1972/73. The Table gives also the total number of man-days worked on each operation in those two years. There was a drop of 18 per cent in the number of man-days worked (and presumably in the number of people employed) on land preparation and planting operations (crow barring, furrowing and forking)[3]. This was due to the greater use of machinery. Women have

displaced/...

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1. "Petite saison" cane is planted in July and August, while "grande saison" cane is planted in March and April. (See Chapter 1, p.22.

2. The data for 1964/65 relate only to the first part of the period i.e. June to December 1964.

3. There was an overall reduction of 18 per cent in the number of man-days worked on estates in 1972/73 in spite of a slight increase, of about 4%, in the area harvested between these two crops.

displaced men to some extent on weeding operations. The percentage of men employed on this work has fallen from 47 to 41 per cent. There has also been an overall reduction of more than one-third in the amount of labour used for weeding, as the use of herbicides spread on estates. Another substantial reduction has taken place in the number of people employed on trashing and land clearing after cutting, as more fields are burnt before cutting. There is consequently less trash left in the fields after the crop. Finally, earthing up is rapidly being abandoned and there has been a drop of 64 per cent in the amount of labour used for that work.

TABLE 56/...

T A B L E 5 6 : Regression Results for 1972/73

Date of Listing	19.11.81 1	5.10.81 2	18.11.81 3	5.10.81 4	5.10.81 5	5.10.81 6	19.11.81 7	19.11.81 8	19.11.81 9	19.11.81 10	19.11.81 11	19.11.81 12	19.11.81 13	19.11.81 14
A	7.8634 (.8173)	8.3000 (1.1181)	.6941 (.3312)	1.7256 (.9520)	.4361 (1.6148)	.0248 (.3241)	57.5258 (1.5681)	43.8759 (1.3949)	9.5295 (.7193)	14.7758 (1.3164)	- -	- -	- -	- -
CLM	.4298 (2.4713)		.5340 (3.1979)		.2685 (1.9403)	.4380 (3.5367)	1.4025 (2.1761)		2.8566 (2.7414)		1.0194 (1.9404)		2.3422 (3.5367)	
CLF	.1334 (.5446)		.1577 (.6495)		.0151 (.4092)	.01629 (.4114)	.1606 (.1690)		.2621 (.1718)		.0573 (.4092)		.0871 (.4114)	
CLT		.3322 (2.9310)		.3943 (3.9516)				1.0735 (2.3582)		1.9176 (2.7309)		.9033 (2.3093)		1.9107 (3.5357)
ICLM	.0649 (.6490)		.0547 (.5218)		.1243 (.9197)	.03638 (.2469)	.6305 (1.0429)		.4379 (.5378)		.4718 (.9197)		.1946 (.2469)	
ICLF	.0633 (.3170)		.1598 (1.1141)		-.0269 (-.2020)	.1099 (.9379)	-.3196 (-.3773)		1.0086 (.9634)		-.1020 (-.2020)		.5878 (.9379)	
ICLT		.0687 (1.0457)		.1044 (1.8669)				.2528 (.8266)		.5977 (1.4452)		.4035 (.9732)		.9285 (1.7507)
W	-.0477 (-1.3452)	-.0383 (-1.4445)	-.0413 (-1.3007)	-.0365 (-1.2759)	-.0324 (-.7576)	-.0184 (-.4087)	-.1218 (-1.0331)	-.1789 (-1.6390)	-.1523 (-.9974)	-.2276 (-1.6987)	-.1229 (-.7576)	-.2053 (-1.4481)	-.5251 (-.4087)	-.2127 (-.9654)
F	.07383 (2.5005)	.0750 (2.9234)	.08212 (3.0477)	.0788 (3.1065)	.1920 (1.1108)	.3697 (2.7902)	.2048 (1.4594)	.2901 (2.6261)	.5443 (3.4285)	.6001 (4.2636)	.7291 (1.1108)	.9847 (1.9794)	1.9771 (2.7902)	2.0649 (3.3346)
QFL	5.6290 (1.0504)	6.9524 (1.4394)	- -	- -	.0890 (1.3611)	- -	2.4519 (1.7887)	2.4775 (1.9445)	- -	- -	.0890 (1.3611)	.0994 (1.7644)	- -	- -
P	.0053 (.3357)	.0094 (0.0557)	.0031 (.1517)	.0126 (.7108)	.0219 (.5607)	.0061 (.1367)	.0377 (.6770)	.0402 (.7460)	.0893 (1.0083)	.1127 (1.3375)	.0833 (.5607)	.1028 (.7284)	.0328 (.1367)	.1538 (.6869)
C	-8.8538 (-0.7624)	-11.6850 (-1.1260)	2.1421 (0.3687)	1.1050 (.1995)	1.3348 (1.2390)	-.2296 (-.6589)	-2.8690 (-.2017)	-2.4229 (-0.1796)	6.1839 (.2987)	14.7758 (1.3164)	5.0682 (1.2390)	3.9686	-1.2279 (-0.6589)	-1.8760 (-1.1049)
$\bar{R}^2$	.9912	.9906	.9904	.9896	.9890	.9863	.6915	.6480	.9731	.9702	.6448	.5898	.9711	.9649
F	162.5	225.7	180.1	253.1	129.6	126.2	3.24	3.94	63.40	86.85	2.62	3.08	58.82	73.25

REMARKS: Figures in brackets are 't' ratios.

T A B L E 5 7 : Regression Results for 1964/65

Date of Listing	18.11.81 15	5.10.81 16	5.10.81 17	5.10.81 18	18.11.81 19	18.11.81 20	18.11.81 21	18.11.81 22
A	5.9220 (.4967)	1.5141 (.6426)	.1171 (.1888)	.0740 (.4971)	20.0869 (.2747)	10.0017 (.5242	- -	- -
CLT	.3419 (1.5898)	.3976 (2.9204)	.2289 (.6460)	.2487 (1.0789)	.8016 (.6808)	1.8122 (1.6249)	.8186 (.6461)	1.2786 (1.0789)
ICLT	.1229 (1.6142)	.1526 (2.2304)	.2872 (1.446)	.2912 (1.5637)	.8800 (2.0198)	1.5400 (2.2517)	1.0269 (1.4456)	1.4972 (1.5637)
W	-.1338 (-3.33110)	-.1365 (-3.4756)	-.0507 (-1.366)	-.0515 (-1.4630)	-.7021 (-2.9929)	-1.0295 (-2.6571)	-.1813 (-1.3659)	-.2647 (-1.4630)
F	.1022 (3.4669)	.1049 (4.0973)	.2923 (.8653)	.3077 (1.2872)	.3944 (1.5291)	.4186 (1.4948)	1.0451 (.8654)	1.5824 (1.2872)
P	-.0006 (-.0111)	.0135 (.2732)	.0189 (.2028)	.0226 (.2824)	-.1607 (-.8206)	-.2772 (-1.1407)	.0675 (.2028)	.1162 (.2824)
QLF	1.2114 (.1823)	- -	.0677 (.4097)	- -	.5108 (-.2166)	- -	.0677 (.4097)	- -
C	2.7628 (.1769)	4.2661 (.4550)	.3602 (.1426)	.1859 (.2706)	98.3075 (3.2044)	184.7014 (4.2211)	1.2880 (.1426)	.9558 (.2706)
$\bar{R}^2$	.9726	.9727	.8824	.8824	.7157	.9171	.3411	.8675
F	81.04	100.96	17.16	21.26	5.75	31.35	1.1831	18.55

TABLE 58 : Percentage of Different Categories of Labour Employed on Each Estate } 29.6.72 - 27.12.72
Percentage of Different Categories of Labour Employed on Each Operation } 28.12.72 - 27.6.73

	Land preparation and planting			Ordinary Weeding			Chemical Weeding			Special Weeding			Irrigation			Trashing			Cutting and Loading			Land Clearing after Cutting			Fertilisation			Earthing up			Repairs to roads, bridges & canals			Miscellaneous Operations			Overall Percentage for each estate		
	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y	M	F	Y
Beau Plan	71	28	-	71	28	-	97	3	-	74	25	-	39	57	2	82	17	-	100	-	-	9	91	-	2	90	6	100	-	-	98	1	-	73	12	13	76	22	2
Belle Vue	78	20	1	45	53	1	100	-	-	72	25	1	84	1	13	44	54	1	98	-	-	7	93	-	7	93	-	89	11	-	87	12	1	72	7	21	67	31	2
Mon Loisir and Beau Séjour	75	24	1	47	53	-	100	-	-	84	13	2	100	-	-	42	58	-	95	3	2	22	78	-	41	59	-	47	53	-	84	1	15	82	15	2	66	33	1
Mount	81	16	3	43	56	1	100	-	-	73	23	4	-	-	-	49	51	-	98	0	2	10	88	2	14	58	28	35	62	3	100	-	-	89	7	4	70	28	2
St Antoine	49	51	-	40	59	1	100	-	-	89	9	1	100	-	-	3	95	2	99	-	1	4	95	1	5	94	1	6	93	-	91	3	6	100	-	-	69	30	1
Solitude	66	30	4	59	35	6	93	6	-	47	51	1	86	12	2	39	60	1	100	-	-	4	95	-	11	89	-	56	44	-	99	1	-	71	8	21	68	28	4
Beau Champ	76	16	8	46	49	5	97	-	3	57	26	17	74	24	2	39	59	2	94	2	4	20	76	4	15	81	4	21	75	4	72	17	11	86	12	2	67	28	6
Constance	60	34	6	43	51	6	100	-	-	87	3	10	99	-	-	20	74	6	99	-	1	5	91	4	22	48	29	54	-	46	83	14	3	83	13	4	64	32	4
FUEL 1	55	43	2	37	62	2	100	-	-	86	12	2				28	71	1	100	-	-	4	92	3	2	95	3	75	23	2	81	18	-	88	8	4	66	32	2
FUEL 2	60	37	3	30	67	4	100	-	-	88	7	5				13	85	2	95	4	1	8	90	3	6	94	-	51	47	1	67	31	2	76	23	1	61	37	2
FUEL 3	37	63	-	49	34	17	100	-	-	60	29	11				32	66	2	100	-	-	12	85	3	9	87	4	100	-	-	76	7	18	70	28	2	63	31	6
Mon Desert Alma	60	37	3	38	60	2	95	1	3	78	11	11	66	33	2	31	67	2	99	1	-	9	88	3	14	79	8	40	57	3	61	21	18	67	26	7	55	41	4
Highlands	59	40	1	27	73	-	100	-	-	47	51	1	95	1	4	19	80	1	95	-	5	9	90	1	30	67	3	87	12	1	99	1	-	82	17	1	54	42	4
Réunion	68	28	4	45	55	-	100	-	-	60	27	13	99	1	-	9	91	-	96	0	4	5	95	-	6	94	-	43	56	1	51	26	23	71	22	7	59	39	3
Médine	73	19	7	39	57	3	100	-	-	83	6	11	94	-	6	9	89	2	99	1	-	3	93	4	19	30	52	-	-	-	91	1	8	88	2	10	70	24	6
Beau Vallon	61	32	7	39	58	2	100	-	-	54	34	12	63	38	-	45	54	1	97	-	3	10	89	1	10	78	12	83	15	3	84	13	3	77	8	14	65	30	4
Mon Trésor	63	29	8	42	53	4	99	-	1	46	35	19	100	-	-	38	60	2	86	7	7	8	89	2	14	79	6	68	30	2	74	13	13	78	6	16	60	33	7
Rose-Belle	52	46	2	47	51	2	100	-	-	41	48	10	-	-	-	11	84	5	100	-	-	14	84	2	19	77	4	52	47	1	69	23	8	67	25	8	57	39	4
Savanah	76	22	2	46	52	2	100	-	-	41	38	22	81	19	-	51	49	-	89	9	2	10	89	2	14	79	7	76	24	-	84	13	3	88	9	3	57	37	5
Bel Ombre	53	39	9	28	67	4	100	-	-	48	45	6	94	3	3	27	70	4	95	3	2	5	92	3	9	53	38	50	27	22	96	1	3	51	27	14	75	20	4
Bénarès	45	52	3	57	41	2	99	1	-	61	31	8	57	41	2	41	59	-	94	2	3	3	93	4	34	54	12	-	-	-	73	27	-	94	5	1	67	31	3
Britannia	50	48	2	64	35	1	99	1	-	19	78	2	-	-	-	27	71	2	90	4	6	11	88	2	38	54	8	80	8	2	82	12	6	79	20	1	59	36	5
St Félix	74	23	13	32	65	3	100	-	-	33	54	14	44	54	2	22	78	-	91	3	6	7	93	-	53	39	9	16	36	84	65	4	30	77	17	6	78	12	10
Union	68	29	3	47	49	4	98	-	2	55	34	11	100	-	-	60	40	-	92	3	5	7	93	-	40	45	15	54	23	23	97	2	1	75	10	15	68	28	5
St Aubin	42	58	-	40	60	-	100	-	-	89	11	-	100	-	-	41	59	-	92	8	-	11	89	-	-	100	-	68	32	-	77	22	-	99	1	-	64	36	0
Overall percentage for each operation	66	30	5	44	53	3	99	-	1	60	30	10	86	12	3	33	66	1	95	2	3	10	88	2	19	68	13	62	35	3	83	11	6	80	14	6			

1. Union, Unité, Bonne Mère, St Julien
2. Queen Victoria
3. Sans Souci

T A B L E 5 9 (a) : Timing of Field Operations: 1964/65 and 1972/73

Description of work	(1)		(2)	(3)	(4)		(5)		(6)	Total no of man-days (7)	(8)
	29.6.64 - 27.12.64		Jan. 1965 - June '65	1% (1+2)	29.6.72 - 27.12.72		January 1973 - June 1973		4% (4+5)	29.6.64 - June 1965 (1+2)	29.6.72 - June 1973 (4+5)
	(000 man-days) M	F	(000 man-days) M + F	%	(000 man-days) M	F	(000 man-days) M	F	%	(000 man-days)	(000 man-days)
Preparation and planting	144.7	112.5	392.1	40	83.4	78.9	320.8	131.5	26	649.3	614.8
Ordinary weeding	200.7	297.1	1031.0	35	68.9	187.7	391.0	333.7	29	1577.1	1081.5
Chemical weeding	46.0	2.0			53.1	0.6	46.9	0.2			
Special weeding	99.0	87.1	222.0	46	75.5	96.5	159.4	97.4	40	408.1	428.8
Irrigation	37.6	35.2	49.2	60	47.8	16.1	52.2	10.9	50	122.1	127.0
Land clearing after cutting	97.2	327.3	2.6	99	30.5	302.7	7.5	14.0[1]	94	427.0	354.7
Fertilization[2]	-	-	-	-	12.1	52.9	7.9	17.6	72	-	90.5
Earthing up	46.1	11.7	22.8	72	7.3	9.3	11.4	1.9	56	80.6	29.7
Repairs to roads, bridges etc and miscellaneous field	215.7	117.5	400.6	45	141.2	98.7	312.8	54.8	39	733.8	607.5
Total male and female man-days worked in each period	887.0	990.4	2120.3	47.0	519.8	843.4	1309.9	662.0	40.9	3998.0	3334.5

1. The 1972 crop finished in the second week of January
2. Fertilization is included in miscellaneous field work in 1964-65.

Source of data: Mauritius Sugar Producers' Association

TABLE 59 (b) : Percentage of Male and Female Labour Used on field Operations: 1964/65 and 1972/73

	29.6.64 - 27.12.64					Jan. 1965 June 1975	29.6.72 - 27.12.72					January 1973 - June 1973				
	(000 man days)			(1% 3)	(2% 3)	(000 man days)				(7% 9)	(8% 9)	(000 man days)			(12% 14)	(13% 14)
	M	F	T			M + F	M	F	T			M	F	T		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Preparation and planting	144.7	112.5	257.2	56.3	43.7	392.1	83.4	78.9	162.3	51.4	48.6	320.8	131.5	452.3	70.9	29.1
Ordinary weeding	200.7	297.1	497.8	40.3	59.7	1031.0	68.9	187.7	256.6	26.9	73.1	391.0	333.7	724.7	54.0	46.0
Chemical weeding	46.0	2.0	48.0	95.8	4.2		53.1	0.6	53.7	98.9	1.1	46.9	0.2	47.1	100	-
Special Weeding	99.0	87.1	186.1	53.2	46.8	222.0	75.5	96.5	172.0	43.9	56.1	159.4	97.4	256.8	62.1	37.9
Irrigation	37.6	35.2	72.8	57.6	48.4	49.2	47.8	16.1	63.9	74.8	25.2	52.2	10.9	63.1	82.7	17.3
Land clearing after cutting	97.2	327.3	424.5	22.9	77.1	2.6	30.5	302.7	333.2	9.2	90.8	7.5	14.0	21.5	34.9	65.1
Fertilization	-	-	-	-	-	-	12.1	52.9	65.0	18.6	81.4	7.9	17.6	25.5	31.0	69.0
Earthing up	46.1	11.7	57.8	79.8	20.2	22.8	7.3	9.3	16.6	44.0	56.0	11.4	1.9	13.3	85.7	14.3
Repairs to roads, bridges etc and miscellaneous field work	215.7	117.5	333.2	64.7	35.3	400.6	141.2	98.7	239.9	58.9	41.1	312.8	54.8	367.6	85.1	14.9
Total male and female man days worked in each period	887.0	990.4	1877.4	47.2	52.8	2120.3	519.8	843.4	1363.2	38.1	61.9	1309.9	662.0	1971.9	66.4	33.6

APPENDIX IV

COMPUTATION OF THE LAND QUALITY FACTOR

The land suitability classification contains eight different classes. To simplify these classes have been reduced to five by amalgamating the "Highly suitable" and "Conditionally highly suitable" and at the other end of the scale "Presently not suitable" and "Not Suitable" categories. Each class has been given an arbitrary value 0 for land which is not suitable to 3 for the highly suitable class. The different land units, their suitability rating and the value assigned to each unit (in respect of its actual suitability for sugar cane) are given below:

AGRICULTURAL SUITABILITY RATING

LUMS[1]			Value
1.1	S3 :	Sugar cane, food crops, mixed cropping	1
1.2	S3 :	Sugar cane, food crops, mixed cropping	1
1.3	S2 :	Sugar cane, mixed cropping	2
	S3 :	Food crops	
1.4	S3 :	Sugar cane, mixed cropping	1
	N1 :	Food crops	
1.5	S3 :	Sugar cane, food crops, mixed cropping	1
1.6	N1 :	Sugar cane, mixed cropping	0
	N2 :	Food crops	
2.1	S3 :	Sugar cane, food crops, mixed cropping	1
2.2	N1 :	Sugar cane, food crops, mixed cropping	0
2.3	S3 :	Sugar cane	1
	N1 :	Food crops and mixed cropping	
2.4	S3 :	Sugar cane, mixed cropping	1
	W1 :	Food crops	
3.1	S1 :	Sugar cane, food crops, mixed cropping	3
3.2	S1 :	Sugar cane	3
	S2 :	Food crops, mixed cropping	

3.3/...

AGRICULTURAL SUITABILITY RATING

LUMS[1]			Value
3.3	S1 :	Tea, mixed cropping	
	S2 :	Sugar cane	2
3.4	S1 :	Tea	
	S2 :	Sugar cane, mixed cropping	2
3.5	S1 :	Paddy rice, mixed cropping	
	S3 :	Sugar cane	1
4.1	S2 :	Forestry, livestock fodder	0
4.2	S2 :	Forestry, livestock fodder	0
4.3	S2 :		0
5.1	S2 :	Sugar cane, food crops, mixed cropping	2
5.2	S2 :	Sugar cane, mixed cropping	2
5.3	S1 :	Tea, limited mixed cropping	
	S3 :	Sugar cane	1
5.4	S2 :	Tea, limited mixed cropping	
	S3 :	Sugar cane	1
	S2 :	Tea	
5.5	S3 :	Sugar cane, mixed cropping	1
5.6	S1 :	Forestry, livestock, fodder	
	S2 :	Tea	
	S3 :	Sugar cane, mixed cropping	1
5.7	S2 :	Forestry, livestock, fodder	
	S3 :	Tea	0
6.1	S2 :	Sugar cane, food crops, mixed cropping	2
6.2	S2 :	Sugar cane, food crops, mixed cropping	2
6.3	S1 :	Tea and limited mixed cropping	
	S2 :	Sugar cane	2
6.4	S1 :	Forestry, livestock, fodder	
	S2 :	Tea	
	S3 :	Sugar cane	1
6.5	S2 :	Forestry, fodder	
	S3 :	Tea and mixed cropping	0
7.1	S1 :	Forestry, fodder, tea	
	S3 :	Mixed cropping	0
7.2	S1 :	Forestry, fodder	0
	S3 :	Tea	
7.3	S3 :	Forestry, fodder	0

8.1/...

1. LUMS : Land Unit Mapping Symbol.

AGRICULTURAL SUITABILITY RATING (Cont'd)

LUMS			Value
8.1	S1 :	Sugar cane, food crops, mixed cropping	3
8.2	S1 :	Forestry, fodder	
	S2 :	Tea, sugar cane	2
9.1	S1 :	Sugar cane, food crops, mixed cropping	3
9.2	S1 :	Forestry, fodder	
	S2 :	Sugar cane	2
10.1	S1 :	Sugar cane	3
	S2 :	Food crops, mixed cropping	
10.2	S1 :	Forestry, fodder	
	S2 :	Sugar cane, tea	2
10.3	S1 :	Forestry, fodder	
	S2 :	Sugar cane	2
10.4	S2 :	Forestry, fodder, wildlife	0
11.1	S2 :	Forestry, fodder, wildlife	0
12.1	S2 :	Forestry, fodder, wildlife	0
13.1	S2 :	Forestry, fodder	
	S3 :	Sugar cane, limited mixed cropping	1

Each estate contains a variety of land units and a land quality factor has been calculated for each estate as the weighted sum of the values of the different land units found on the estate. The relative size of each unit was used as weight for this purpose. The size of the land units was measured with a planimeter and the results are tabulated below. These sizes are expressed in square centimeters and can be easily converted into arpents or any other measure. Many different units have the same suitability rating for cane and when they are found on the same estate, they have been grouped together as in the table below:

Name of Estate/...

TABLE 60 : Determination of Land Quality Factor

Name of estate	Land Unit Symbol	Area in sq.cms of individual units or group of units	% Total area	Land quality values	Land quality factor
Medine	1.2, 1.4, 2.1, 2.4, 13.1	40.7 cm^2	.82	1	
	1.4, 2.1, 2.3	4.6 cm^2	.09	1	1.01
	10.4, 11.1	1.8 cm^2	.04	0	
	6.1, 6.2, 5.2	2.4 cm^2	.05	2	
		49.5cm^2			
Solitude	2.1,, 2.4, 13.1	8.0cm^2		1	1.00
Beau Plan	1.1, 1.4, 2.1, 2.3	4.8 cm^2		1	
	2.1, 2.4, 1.1, 1.4	6.2 cm^2		1	1.00
		11.0cm^2			
Mount	3.1, 3.2	7.0 cm^2	.33	3	
	1.3	8.6 cm^2	.40	2	2.06
	1.1, 1.4	3.4 cm^2	.16	1	
	2.1, 2.3	2.4 cm^2	.11	1	
		21.4 cm^2			
Belle Vue	1.1, 1.2, 1.4, 2.1	18.3cm^2		1	1.00
St Antoine	1.1, 1.2, 1.4, 2.1, 2.4	13.5 cm^2	.79	1	
	1.6	3.5 cm^2	.21	0	.80
		17.0cm^2			
Mon Loisir	1.6	13 cm^2	.35	0	
	1.1, 1.4, 2.1	14.6 cm^2	.40	1	.90
	1.3	9.1 cm^2	.25	2	
		36.7cm^2			
Constance	1.6	26.4 cm^2	.73	0	
	1.4, 1.5	1.9 cm^2	.05	1	.71
	3.1, 3.2	7.9 cm^2	.22	3	
		36.2cm^2			
FUEL	1.4, 1.5	9.3 cm^2	.13	1	
	3.1	25.1 cm^2	.34	3	
	5.4, 5.5	5.5 cm^2	.07	1	
	5.6, 5.7	17.7 cm^2	.24	0	1.52
	1.4	6.2 cm^2	.08	1	
	1.6	2.0 cm^2	.03	0	
	6.3	8.5 cm^2	.11	2	
		74.3cm^2			

Name of estate	Land units symbol	Area in sq.cms of individual units or group of units	% Total area	Land quality values	Land quality factor
Beau Champ	1.4	11.0 cm^2	.31	1	
	3.1	12.4 cm^2	.35	3	1.58
	3.3	3.7 cm^2	.11	2	
	5.6, 1.6	8.0 cm^2	.23	0	
		35.1 cm^2			
Ferney	3.1, 3.2	6.2 cm^2	.19	3	
	3.3, 10.2	13.4 cm^2	.40	2	1.37
	11.1	13.6 cm^2	.41	0	
		33.2 cm^2			
Riche en Eau	3.1, 3.2	10.5 cm^2	.42	3	
	3.3, 3.4, 10.2	8.2 cm^2	.42	2	
	1.4	6.6 cm^2	.26	1	
		25.3 cm^2			
Mon Desert/ Mon Tresor	1.2, 1.4, 1.5	28.1 cm^2	.63	1	
	5.4, 5.5	10.1 cm^2	.23	1	
	3.1, 3.2	3.8 cm^2	.09	3	1.16
	13.1	1.5 cm^2	.03	1	
	1.6	1.1 cm^2	.02	0	
		44.4 cm^2			
Savannah	1.4, 1.5	11.8 cm^2	.50	1	
	1.3	1.7 cm^2	.07	2	1.93
	3.1, 3.2	10.0 cm^2	.43	3	
		23.5 cm^2			
Rose Belle	5.4, 5.5, 1.5	11.6 cm^2	.47	1	
	5.6	3.5 cm^2	.14	0	
	3.3, 10.2	2.4 cm^2	.10	2	1.19
	6.3	5.8 cm^2	.23	2	
	6.4	1.4 cm^2	.06	1	
		24.7 cm^2			
Britannia	3.1	9.0 cm^2	.47	3	
	3.3, 3.4	4.8 cm^2	.25	2	2.08
	5.4	3.2 cm^2	.17	1	
	5.6	2.0 cm^2	.11	0	
		19.0 cm^2			
Benares	3.1, 3.2	15.5 cm^2		3	3.00

Union/...

Name of estate	Land units symbol	Area in sq.cms of individual units or group of units	% Total area	Land quality values	Land quality factor
Union St Aubin	3.1, 3.2	22 cm^2	.70	3	2.70
	3.3, 3.4	9.3 cm^2	.30	2	
		31.3 cm^2			
St Felix	1.4, 1.5, 13.1	3.8 cm^2	.33	1	1.49
	3.1, 3.1	.7 cm^2	.06	3	
	10.2	5.6 cm^2	.49	2	
	5.6	1.3 cm^2	.11	0	
		11.4 cm^2			
Bel Ombre	3.1, 3.2, 10.1	12.4 cm^2	.23	3	1.60
	10.2	14.8 cm^2	.28	2	
	11.1	10.3 cm^2	.19	0	
	8.1	2.0 cm^2	.04	3	
	8.2	5.6 cm^2	.10	2	
	1.4	1.8 cm^2	.03	1	
	10.4, 4.1, 4.2	6.7 cm^2	.13	0	
		53.6 cm^2			
Réunion	2.1, 2.4	4.5 cm^2	.13	1	.79
	4.1, 4.2, 10.4	12.1 cm^2	.35	0	
	6.1, 6.2, 6.3	6.1 cm^2	.18	2	
	5.4, 5.5, 6.4	1.6 cm^2	.05	1	
	7.1	1.6 cm^2	.05	0	
	5.4, 6.4	1.7 cm^2	.05	1	
	5.1, 5.2, 6.1	6.7 cm^2	.19	1	
		34.3 cm^2			
Highlands	5.1, 6.1, 6.2, 6.3	19.4 cm^2	.97	2	1.97
	5.4, 5.3, 6.4	.5 cm^2	.03	1	
		19.9 cm^2			
Mon Désert-Alma	5.4, 6.4	8.8 cm^2	.20	1	1.43
	6.3	5.1 cm^2	.12	2	
	6.1, 6.2, 5.2	21.0 cm^2	.48	2	
	5.5	1.3 cm^2	.03	1	
	5.6	2.4 cm^2	.06	0	
	10.4, 4.1, 4.2 4.3, 11.1	5.0 cm^2	.11	0	
		43.6 cm^2			

C O N C L U S I O N

Under the pressure of events after the Second World War, social and economic conditions in Mauritius went through a process of rapid change. The main forces behind the process of change were the population explosion and the constitutional changes which preceded independence from Britain in 1967. These were accompanied by the emancipation of population as a result of a rapid increase in the rate of schooling and the opening-up of Mauritius to the outside world.

At the time when the demographic explosion posed a serious threat to the Island's future economic and social stability the British colonial authorities introduced a number of constitutional changes which liberalised the Island's political system, established universal adult suffrage and brought to power the representatives of the urban and rural working classes.

Labour policy forms an integral part of a country's social and economic policy. The setting-up of Wages Councils for agricultural and non-agricultural workers in the sugar industry in 1963, marked a major departure from the traditional Governmental attitude of non-intervention in labour matters. These measures may thus be seen as the outcome of the postwar social and economic events which propelled the Island forward on a path of development and accentuated the underlying stresses which are inherent in the Island's plantation system, particularly the latent antagonism between the white plantocracy and the Indian labourers.

The organisation/....

The organisation of the sugar industry, the characteristics of the plantation society, the structure of the labor market and the macro economic environment represent four essential elements in our analysis of Government labour policy. In the first chapter we have analysed the influence of structural and institutional factors, notably the structure of land ownership and the organisation of the sugar industry on the choice of technology, the level of output and the demand for labour.

We argued that the high concentration of land on estates has caused serious distortions in the allocation of resources, the under-utilisation of land on estates and the wasteful use of labour on small plantations. This has been a cause of the yield gap between estates and small plantations and depressed productivity and earnings in the industry generally. Institutional factors, the structure of land-ownership and the linkages between cane production and sugar manufacture, may have had a strong influence on the demand for labour and the rate of employment and earnings inside the industry. Besides the plantation system has created a modern capitalist sector[1] which is centred on the sugar estates and characterised by modern management and high technology and a large group of small cane planters - a rural proletariat - reflecting in its attitudes, many of the attributes of traditional rural societies. The stresses and strains found in the Island's social system - a condition of underlying social tension, may be partly explained by the high concentration of land and other productive resources inside the industry. The land tenure system in turn forms an integral part of the social and political fabric of Mauritius.[2]

The/...

1. The term "capitalist" is used here to refer to a system of production based on capital - intensive technology, the private ownership of capital and the profit motive.
2. See Chapter 3, p.184, footnote 3.

The second major element in the analysis of Government labour policy consists in the study of the social factors operating within the Island's plantation system. The plural society with its origins in slavery and indentures gave rise in time to growing stresses within the system which reinforced the process of change and found expression in the 1963 Wage Regulation Orders. Government's decision to intervene directly in the labour market through the establishment of Wages Councils in the sugar industry followed the transfer of the effective political power from the hands of the white plantocracy of sugar estates owners, into the hands of Hindu and Creole politicians, the representatives of the subordinate classes.

The plantation system had a considerable influence over the development of the Island society. We have in the second chapter presented historical evidence in support of this assertion. Developing countries in general and plantation economies in particular have certain inherent characteristics which retard the development of industrial relations. A modern industrialised society and well organised labour force are essential prerequisites for the establishment of an effective system of collective bargaining; for effective collective bargaining requires a number of preconditions - social, industrial and institutional - which even in industrialised countries have not always obtained and which are far less likely to be found in developing colonial societies.

The labour system in Mauritius has many features which are common to other developing countries. Mauritius has a fragile economy which depends on an unstable export crop, sugar, an heterogeneous labour force and a segmented labour market, reflecting the complex pattern of social divisions found in the Island. Trade

unions/...

unions are relatively weak and unstable and in the presence of a growing labour surplus in the organised sector would appear to have had little influence or control over wages.

These short-comings have led observers to advocate more direct measures by Government to safeguard and promote the interests of workers. In the absence of a well developed mature system of industrial relations, it was incumbent on Government to take the lead and fix the level of wages in accordance with established needs and national priorities. Thus the establishment of Wages Councils in the sugar industry may be seen as the logical outcome of the state of underdevelopment of industrial relations and the radical changes which have taken in the Island's social and economic system after the war.

This has naturally led to a decline in the part played by employers and trade unions in the process of wage determination. An effective system of collective bargaining provides certain safeguards against excessive or irrational behaviour on the part of employers or trade unions. Free negotiations between employers and trade unions within an efficient system of industrial relations, ensure that current economic realities, as reflected in the conditions of demand for and supply of labour, will influence the outcome of wage negotiations.[1] Without these safeguards, public authorities have

proven/...

1. On the other hand free negotiations between employers and unions in individual industries may not necessarily result in a rational wage policy at the national level. For a wage settlement in a particular industry may spillover to other industries, and induce wage increases in these industries and thus have important secondary effects on the rest of the labour market. Thus Government might still have an important monitoring role to play even in the presence of a well developed system of industrial relations.

proven singularly susceptible to the presence of organised groups and Government decisions on wage matters have often been made for reasons of political expediency without an adequate analysis of the implications for the economy as a whole.[1]

Thus in many developing countries Government has had a major influence on the level of wages. Government may influence wages both directly through the imposition of statutory minimum wage and indirectly through its policies with respect to the government labour force. In these countries the statutory minimum rate is an "effective" rate in most cases close to and sometimes even above the prevailing rates.[2]

In the third chapter we analysed the effect of wage regulations in the sugar industry on the level of wages and earnings in the Island. Starting from Meade's assertion regarding the importance of the sugar industry in the labour market, we analysed the relationship between earnings in the sugar industry and other sectors. The importance of the relationship will depend on the structure of the labour market - especially the strength of the linkages between the different sectors, the importance of trade unions and the imitative behaviour of employers and unions in wage matters. We analysed the relation between the rate of earnings of daily-paid labour in the sugar industry and earnings of the same category of labour in (i) Docks and Stevedoring, (ii) Government and (iii) All Activities except Sugar. Except in the case of Docks and Stevedoring, which is a satellite sector of the sugar industry, catering principally for the

export/...

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1. See above Chapter 2, p.109.
2. On the importance of government in African labour markets, see C R Frank. Op.cit. p.255.

export of the annual sugar crop, these results do not substantiate the alledged strong influence of the sugar industry on wages in other activities at any rate during the first part of the period.[1]

We then proceeded to analyse the changes which have taken place in the wage structure in order to detect the influence of institutional forces - especially trade unions and Government - on the evolution of wages in the Island. It was found in this connection that the evolution of the wage structure in Mauritius was broadly similar to that of other developing countries, with a widening of absolute differentials, following a rapid increase in the rate of earnings of monthly and daily-paid labour during the second part of the period, while the relative differentials - or coefficient of variation - remained relatively stable during that period.

According to professional observers of the process of wage determination in unionised labour markets, the presence of strong trade unions may result in a high degree of intersectoral wage interdependency. If there is a strong wage transfer mechanism between different industries we would expect a close association between the movement of wages (or earnings) in these sectors. In order to detect the interdependence between industries in this regard, we compiled an index of the earnings of monthly- and daily- paid labour, with 1966 as the base year, from which we calculated the degree of correlation in the rate of increase in earnings in different industries between 1966 and 1975. It appears that there was no significant relationship

in the/...

1. Between 1966 and 1970, the stipulated (minimum) wage rates of the sugar industry agricultural labour force were increased on two occasions, in 1968 and 1970, each time by 5 per cent.

in the rate of increase in earnings between 1966 and 1969 and 1969 and 1972, but a strong correlation after 1972, when earnings in different industries increased at a fairly uniform rate. These results reflect the changes made in the Government wage policy after 1971, when Government decreed a series of uniform wage increases "across the board" applying indiscriminately to all the wage regulated sectors.

We also carried out another test of the influence of trade unions on the wage structure by means of a ranking of industries with regard to earnings.[1] There is a significant increase in the value of the correlation coefficient (R^2) between 1966-70 and 1970-75. The results however showed a fairly high degree of flexibility in the ranking of industries for both monthly and daily rated earnings between 1966 and 1975. Thus the available evidence does not support the view that unions had an important influence on the evolution of wages in the Island between 1966 and 1975. On the other hand the results would indicate that the Government labour policy had a strong influence on the evolution of earnings especially after 1971. In fact ever since the establishment of Wages Councils in the sugar industry in 1963, unions appear to have played a secondary subdued role and Government has assumed almost complete responsibility, in wage matters in the regulated sectors of the labour market.

The Government thus emerges as the determinant factor in industrial relations and had a preponderant influence on the recent evolution of wages in the Island. But the influence of

Government/....

1. Trade unions are generally very active in defence of their members' position within the wage hierarchy. On this assumption the presence of strong trade unions would tend to produce a stable structure of industries with regard to earnings.

Government in the labour market was not confined to wages. Government is also generally a very large employer of labour in developing countries, often employing forty per cent or more of the total labour force in the organised sector of the economy.[1] In Mauritius the number of persons working in the public sector[2] has been increasing rapidly and Government now employs more than 45 per cent of the labour force in large establishments.[3] Thus Government is the alternative employer in the Island labour market and its policies with regard to its own labour force may have a strong influence on labour conditions elsewhere in the economy.

We have argued that Mauritius, together with other developing countries has a distorted wage structure characterised by an "effective" wage gap between the modern (urban) sector and the traditional (rural) sector. In our adaptation of the wage-gap hypothesis to Mauritius, the urban sector is represented by Government while the traditional sector is represented by the sugar industry and especially the informal rural sector consisting of the small cane producers. Although the rates paid to unskilled labour in the sugar industry may exceed the wages paid to the same category of labour in Government, workers may prefer Governmnet work to working in the sugar industry for a number of reasons: there is greater security of employment in Government than in the sugar industry where much of the work is seasonal in nature.[4] There are also better promotion

prospects/...

1. For figures regarding the importance of Government in non-agricultural employment in African countries, see C R Frank: Op.cit. p.255. See also: International Labour Office: Year Book of Labour Statistics.
2. Including public corporations.
3. For a definition of the term, see above Chapter 2, p.104 footnote 1.
4. Please see footnote next page.

prospects for unskilled labour in Government than in the sugar industry.[5] Besides Government work is generally lighter than work in the sugar industry. This implies that, although the actual wage rate may be higher in the sugar industry, the "effective" wage rate for an equivalent amount of work may be higher in Government. Finally Government work carries a higher status than agricultural work. We have thus established that there are a number of advantages in working for Government, which would induce workers, especially those in the residual agricultural labour force,[6] to prefer a Government job even at lower rates of remuneration to working in the sugar industry and other sectors. This leads to a steady withdrawal of labour from traditional rural occupations, reduces the supply of labour to these sectors and creates a growing excess supply of labour in the public sector. Thus the existence of an "effective" wage gap, which results from the wage and hiring policies in the public sector, may explain the labour difficulties experienced by the sugar industry in a situation of growing unemployment. As the number of people employed by Government increases the conditions in that sector tend to become the standard that will be adopted elsewhere. This may result in a general decline in productivity which may have serious repercussions in such an open economy as Mauritius.

Having/....

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4. Although most of the field labour on estates forms part of the regular labour force and is employed on a permanent basis estates generally employ some additional labour during the crop, while small planters do not use a regular labour force.
5. The wage gap hypothesis as propounded by Harris and Todaro and others considers the gap in earnings over the workers' working life or time horizon, see M P Todaro: Labour Migration and Unemployment in Less Developed Countries: American Economic REview, March 1969, p.141.
6. For a definition of the term see above, ch 3, p.200.

Having established the preponderent role played by Government in the Mauritius labour market and its influence on the level of wages and the allocation of labour in the Island, we then analysed the effect of Government labour policy on the macro-economic equilibrium, particularly Government net revenue and the Balance of Payments. Our main purpose was to determine the limits imposed on Government labour policy by the monocrop structure of the economy and its high dependence on imports. Government wage policy generally has important redistributional effects in the economy; these redistributional effects in turn may affect the rate of savings and investment, Government revenue and the Balance of Payments. The study of the macro-economic effects of Government wage policy necessitated a detailed investigation of the relationship between wages, prices and incomes, and the effects of changes in these aggregates on the macro-economic balance. The Social Accounting Matrix, which is based on a generalisation of the Input-Output technique, provides a convenient means of determining the total effect of Government wage policy and thus identifying the constraints facing Government in this regard. It incorporates into a single matrix different sets of accounts covering the production activities and the distribution of income and its expenditure, in order to present in the form of a coherent data system, these relevant aspects of economic activity.

As we have said above our objective was to investigate the monocrop structure of the Mauritian economy with its specialised system of production, high dependence on overseas markets and weak intersectoral linkages and the limits set on Government policy in wage matters. Meade once made reference to this point in these terms: "In Mauritius the danger of pushing up wage costs is much more serious (than in UK) for the general level

of/....

of money prices is set by the outside world economy; if wage costs rise relatively to selling prices, the main result will be a smaller field for the profitable employment of labour; a higher real wage for those in employment but only at the expense of mass unemployment."[1]

On the basis of the detailed quantitative information given in the SAM regarding the structure of production, income distribution and expenditure in Mauritius, we went on to calculate the effect of a doubling of wages on household income, Government revenue and expenditure and the Balance of Payments. The methodology followed is explained in the text. In 1974, there was a surplus of Rs 318 million in the Balance of Payments.[2] This represents about 15% of the exports of goods and services. The results show that a doubling of wages would have resulted in a deficit of Rs 256 million in the Balance of Payments or about 12% of the total exports of goods and services. On the other hand,it appears that with a surplus of Rs 344 million in its recurrent budget (on an accrual basis), Government was in a strong financial position and could have accommodated the estimated fall in net revenue, following the postulated doubling of wages.

Finally in the fifth chapter, we analysed the effect of the Wage Regulation Orders on the sugar estates labour force. The first step was to investigate the conditions of labour demand and supply. The marginal productivity of agricultural labour in the sugar industry is strongly influenced by seasonal factors. This is shown by the system followed on estates where field

operations/...

1. In the SAM, the surplus in the R.O.W. account is shown as Rs 301 million. The discrepancy is due to the net factor income from abroad. According to the official figures, there was a surplus of Rs 10 million under this item, but the SAM shows a net outgoing of Rs 10 million on that account.

operations are classified into different grades and paid at different rates. The differences in the grading and rating of work reflect differences in the arduousness of the task and in its productivity.[1] A large proportion of field work during the intercrop was designated as Class II work and the rates paid for that class of work were about 25 per cent less than for Class I work. In these conditions the introduction of guaranteed intercrop employment, based on the rate of attendance and performance of labour during the crop, would tend to depress the marginal productivity of labour during the intercrop below the stipulated wage rate and lead to an overall reduction in the level of employment of labour on estates.

On the supply side, the system of recruitment, the social environment and the availability of alternative occupations will determine the supply of labour to the estates. Before the passing of the Wage Regulation Orders, the majority of the estate labour force consisted of casual workers, most of them recruited and paid by job contractors.[2] Besides labourers have an inveterate aversion to field work on estates. This aversion originated in the coercive labour conditions on the early plantations, which left their mark on the attitudes of people and the nature of group relations in the plantation society. According to certain observers, the strong dislike of plantation work may account for the high rate of absenteeism in the industry. Other factors which may also explain absenteeism are the nature of the work - a strenuous, physically exhausting work - and working conditions, i.e. distance to work, relief and climate.[3]

Finally/...

1. See above Chapter 5, pp.321-324.
2. The job contractor, often occupied a position of status and authority in his own village and was an important link between the traditional society to which the labourer belonged and the estate. See above, Chapter 2, p.98.
3. See above, Chapter 5, Part I, pp.335-338.

Finally another factor which has some influence on the supply of labour to the estates, is the rate of unemployment (and underemployment) among agricultural labourers. Before the establishment of a regular labour force on estates, there was much seasonal unemployment among sugar industry labourers reflecting the seasonal conditions in the demand for labour. This created a reserve pool of labour during the intercrop season which was available for work on estates, when required. But the creation of a regular labour force and the massive recruitment of labour on public work projects with the introduction of relief work in 1965, and, more recently, the establishment of the Development Works Corporation and the Tea Development Authority have radically altered the conditions of labour supply in the industry through the decentralisation of employment on estates and by providing important alternative outlets for workers, especially those belonging to the residual labour force. Thus in addition to the social factors, militating against field work on estates, there are economic considerations as well which have induced workers to withdraw from their previous occupations in quest of a Government job. This created a shortage of labour in the sugar industry especially during the crop season and hastened the mechanisation of field operations.

From what we have said above, it appears that the sugar industry labour market is characterised by slack conditions during the intercrop when the supply of labour is relatively abundant. In these conditions, the introduction of a minimum wage above the market rate will give rise to a substantial excess supply of labour; while the stipulations regarding intercrop employment will lead to a more rational use of labour during the crop.

These/....

These hypotheses were verified by means of production functions fitted to the 1965 and 1973 crop data, in order to assess the changes which have taken place in the marginal productivity of crop and intercrop labour during that period.

In the first part of the Chapter, we considered the problems encountered in the choice of variables and their specification namely differences in the quality of inputs especially land and labour, the form of the production function and the use of a single equation procedure for the estimation of an agricultural production function. We also discussed problems of estimation of production functions from cross sectional observations: the identification problem, multicollinearity and heteroscedasticity. The rest of the chapter was devoted to an interpretation of the results.

There is in all the 1973 regressions a significant difference between the value of the coefficients of male crop and intercrop labour. The coefficient of male crop labour is always highly significant,[1] and sometimes very highly significant, while none of the coefficients of male intercrop labour is significantly different from zero. When male and female labour are combined into a single category, the coefficient of (combined) crop labour is highly significant, in all the regressions, while the coefficient of (combined) intercrop labour is significant in only two regressions (at the 5% level) and marginally significant (at the 10% level) in a third one. These results are in sharp contrast to those obtained from the 1965 observations. In that case the coefficient of combined crop labour[2]

is only/...

1. For a definition of the terms see above p.389, footnote 1.
2. The 1965 data do not differentiate between male and female labour, see above, Chapter 5, p.376.

is only significant once; on the other hand, the 1965 intercrop labour coefficient is highly significant in three regressions and significant at 10% level everywhere else.

These results are what we would expect from the introduction of minimum wage coupled with compulsory intercrop employment. Before the passing of the Security of Employment Ordinance (No. 28 of 1963), most of the labour employed on estates was casual labour, mostly recruited through job contractors on an "ad hoc" basis for specific operations.[1] The new legislation created a regular labour force. The obligation to provide employment during the intercrop for a large part of the crop time labour force induced estates to rationalise on the use of labour during the crop in order to reduce their intercrop commitments. That could explain the very significant improvements in the results obtained with the crop labour in 1973, as compared with 1965, and by contrast the sharp drop in the value of the intercrop labour coefficients in 1973 as compared with 1965.

Other results concern Arpents Harvested, the Land Quality Factor, Weedkillers, Fertilisers and Land Preparation and Replanting. There is little difference in the results obtained with arpents harvested in 1965 and 1973. On the other hand the coefficient of the Land Quality Factor is significant three times out of four in the 1973 regressions using deflated (per arpent) data but not significant in any of the 1965 regressions. Besides the treatment of land quality differences has a significant influence on the results. The coefficient of weedkillers is very highly significant or significant in many of the 1965 regressions; it is not significant in any of the 1973

regressions./...

1. See Chapter 5, pp331/332.

regressions. Agro-climatic conditions and especially the amount of rainfall, have a strong influence on the rate of application of weedkillers. Rainfall, or the lack of it, is also one of the most important factors in the agro-climatic differences between estates in the Island.[1] Changes have also been made in the system of weed control between 1965 and 1973. By contrast agro-climatic differences would appear to have had no significant effect on the amount of fertilisers used on estates or the value of the regression coefficient. Finally the coefficient for land preparation is not significant in any of the 1965 or 1973 regressions.

In the last section we considered the effect of the Wage Regulation Orders on the organisation of field work on estates. The figures show that there was a substantial redeployment of labour between the crop and intercrop and an overall reduction in the number of persons employed with the mechanisation of heavier field work and the increasing use of herbicides for weeding operations. It appears therefore that the wage orders and Security of Employment Ordinance had a significant impact on the productivity of labour on estates. On the other hand the changes which have taken place in the organisation of field work show that, in spite of the importance of natural factors, there is scope for adjustment in the sequence of operations; as a result of these adjustments there has been some reduction in the seasonality of the demand for labour on estates.

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1. See above, Chapter 5, p.395, footnote 1.